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AN ANALYSIS OF THE ELECTRONICS DISTRIBUTION DEPOT MISSION AT DA-ETC(IU)  
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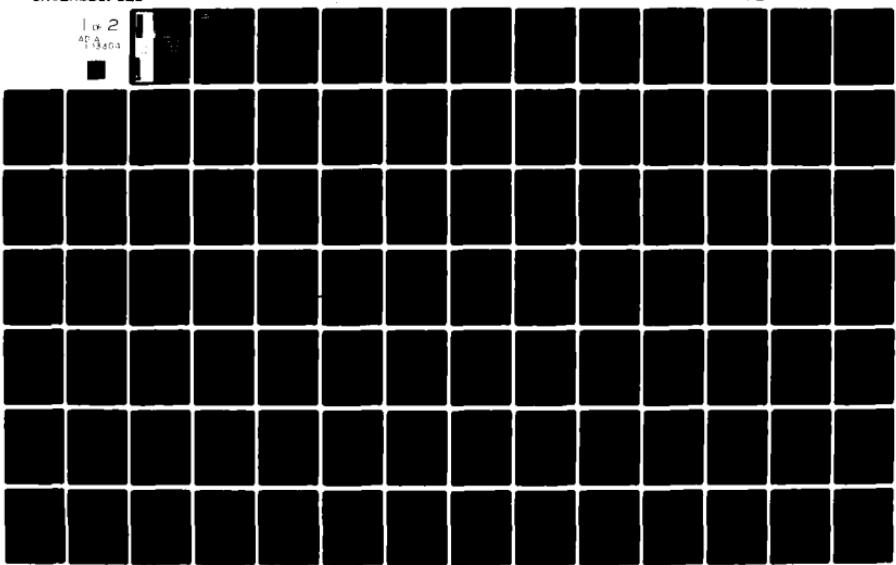
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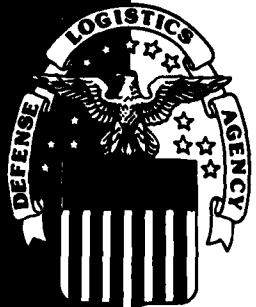
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AN ANALYSIS OF  
THE ELECTRONICS DISTRIBUTION  
DEPOT MISSION  
AT DAYTON, OHIO.

29 August 1977

Revised: 15 December 1977

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DLA-LO

30 Dec 77

FOREWORD

This report examines the feasibility of relocating the DLA depot mission at Dayton, Ohio, to other DLA and DoD depots. It also examines the feasibility of consolidating the DLA electronics mission at Dayton, Ohio. A computerized linear programming (LP) model was used to assign workload to the potential recipients on the basis of inbound and outbound transportation costs. Feasible alternatives were selected from the set of alternatives used in the LP and the costs and savings associated with each alternative were computed and compared. Conclusions were developed by comparing the results of the cost analysis with certain unquantified considerations. The relocation of the Dayton Depot was found to be economically feasible for the Defense Department. However, any decision regarding relocation must consider the environmental and socioeconomic impact on the losing and gaining communities.

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## EXECUTIVE SUMMARY

### OBJECTIVE:

- a. To determine the economic and operational feasibility of relocating the DLA depot mission at Dayton, Ohio, to other DLA and DoD Depots.
- b. To compare the relocation of the electronics mission from Dayton with the alternative of consolidating the DLA electronics distribution mission at Dayton. Currently, the DLA electronics distribution mission is primarily split between Dayton, Ohio, and the DLA depot in Ogden, Utah.

### PURPOSE:

To assure that the DLA distribution system provides the best balance of responsive support to its customers and economy of operations.

### BACKGROUND:

Six analyses of the total DLA distribution system have been made since 1962. Each of these analyses has concluded that the DLA depot mission at Dayton, Ohio, should be relocated to other depots. A 1976 analysis, supplemented in 1977, of the feasibility of relocating the depot at Dayton concluded that the depot should be relocated and recommended an in-depth analysis, including an environmental assessment, of such relocation. The conclusions of each of these analyses were driven by the location of the military customers served by DLA, the demand for DLA stocked materiel, the location and capacity of DLA's depots and the total investment and operating cost of the DLA distribution system. Conversely, two analyses of the distribution of electronics materiel only, made by DESC in 1973 and 1976, concluded that there should be a single distribution depot for electronics.

The analysis documented in this report was made as a result of the 1976 and 1977 analyses which recommended an in-depth analysis of relocating the depot at Dayton.

### SCOPE:

This analysis examined the feasibility of relocating the electronics distribution mission only. It examined relocation of the depot at Dayton with other DLA and Military Service depots as well as relocation of the electronics distribution mission at Ogden, Utah, with the depot at Dayton.

### METHODOLOGY:

Each DLA depot and those Military Service depots which stock electronics materiel were examined for location relative to customer demand,

space availability, and processing capacity. Those depots which could absorb all or part of the electronics distribution mission, within the constraints of DLA policy and Service peculiar requirements, were considered candidates for receiving part of the current depot mission at Dayton.

A computerized linear programming (LP) model was then used to assign workload to the potential recipients on the basis of inbound (from vendor to depot) and outbound (from depot to customer) transportation costs.

Feasible alternatives were selected from the set of alternatives used in the LP and the costs and savings associated with each alternative were computed and compared. Conclusions were then developed by comparing the results of the cost analysis with certain unquantified considerations.

#### RESULTS:

A. Alternatives. Two feasible relocations of the Dayton Depot were selected from the set of relocations in the LP. Also included in the analysis is a relocation of the Ogden electronics mission to Dayton.

1. Relocate the depot at Dayton, Ohio, to the DLA depots at Richmond, Va., and Ogden, Utah, and the Navy depot at Norfolk, Va. Two versions of this alternative are included to show differences between HQ DLA and Dayton estimates of costs and savings.

2. Relocate the depot at Dayton, Ohio, to the DLA depots at Richmond, Va., Ogden, Utah, and Columbus, Ohio, and the Navy depot at Norfolk, Va.

3. Relocate the electronics mission at the Ogden, Utah, depot to the depot at Dayton, Ohio.

B. Costs and Savings. The one-time costs and recurring savings resulting from, and the numbers of people affected by, each of these relocations are summarized in Figure 1. Alternative 1 indicates annual recurring savings of \$3.1 million at a one-time cost of \$3.9 million based on HQ DLA estimates. DESC estimates the one-time costs to be \$4.8 million with recurring savings of \$2.6 million. For Alternative 2, one-time costs are estimated to be \$3.8 million with recurring savings of \$3.1 million. For Alternative 3, one-time costs are estimated at \$1.2 million with recurring costs of \$.3 million.

#### C. Other Considerations

1. Certain multiple location costs would be avoided by adoption of any alternative; the Defense Audit Service was unable to validate our estimate of \$20.66 per split shipment. Using our estimate, adoption of Alternatives 1 or 2 would yield additional annual savings of \$.4 million; Alternative 3 would yield annual savings of \$1.1 million. Relocation of

FIGURE 1  
SUMMARY OF COSTS AND SAVINGS (\$ THOUSANDS)

	ALTERNATIVES		
	1	1a	2
	Relocate Dayton to Richmond, Ogden & Norfolk	Relocate Dayton to Richmond, Ogden & Norfolk (DESC Data)	Relocate Dayton to Richmond, Ogden, Columbus & Norfolk
Personnel Transfers to Gainers	449	478	449
Personnel Reductions	167	137	167
One-Time Costs (\$000)	3,858	4,801	3,804
*Annual Savings (\$000)	3,131	2,611	3,118
Cumulative Discounted One-Time Costs (\$000)	3,626	4,512	3,575
Cumulative Discounted Seven-Year Savings (\$000)	13,616	11,300	13,620
Break-even Year	FY 80	FY 80	FY 80
*Annual Savings Including Duplicate Location	3,482	2,962	3,469
Break-even Year with Duplicate Location Savings	FY 80	FY 80	FY 79
			FY 80

the DESC Depot would result in a one-time cost avoidance of \$3.8 million for improvement projects. In addition, because wage board rates are higher in the Dayton area, adoption of Alternative 3 would increase costs by \$.3 million (see Figure 1, \*).

2. The DoD Materiel Distribution Study (DODMDS), which is examining the entire DoD distribution system, is scheduled for completion in March 1978. The preliminary findings are consistent with the alternatives in this analysis.

3. Separation of the depot from DESC will leave over 2,000 people at the installation occupying less than 25% of the space. The vacated space could be utilized by DLA or another government organization.

4. The Commercial Commodity Acquisition Program (CCAP), the Commercial Item Support Program (CISP) and the Contractor Operated Civil Engineering Supply Stores (COCESS) program could significantly reduce the number of items stocked and distributed by DLA depots. Conversely, the Item Management Coding (IMC) program could significantly increase the number of items stocked and distributed by DLA depots.

5. There will be some turbulence resulting in reduced customer support during any realignment. The relocation plan attempts to minimize degradation of support.

6. An environmental assessment must be made for any alternative selected from this analysis and the results considered in any decisions.

#### CONCLUSIONS:

A. It is economically and operationally feasible to relocate the Dayton Depot to other DLA and DoD depots as described in Alternatives 1 or 2 of this analysis. Combined errors of at least 25% in the estimates of both the one-time costs and recurring savings would be necessary to change the outcome of this analysis.

B. It is not economically feasible to relocate the electronics mission at Ogden, Utah, with the Dayton Depot without considering duplicate location savings. Even considering duplicate locations, the magnitude of the savings is so small, in comparison to the other alternatives, that such an action does not warrant the changing of current DLA policies regarding two stock locations.

C. The preliminary findings of DODMDS are consistent with the alternatives in this analysis.

D. Although relocation of the Dayton Depot is economically feasible for the Defense Department, any decision regarding relocation must consider the environmental and socioeconomic impact on the losing and gaining communities. Those impacts are examined in a separate analysis.

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AN ANALYSIS OF  
THE ELECTRONICS DISTRIBUTION DEPOT MISSION  
AT DAYTON, OHIO

1. OBJECTIVE

- a. To determine the economic and operational feasibility of relocating the electronics distribution mission at Dayton, Ohio, with other DLA and DoD Depots. The Dayton Depot is part of the Defense Electronics Supply Center (DESC), a primary level field activity of the Defense Logistics Agency (DLA).
- b. To compare the relocation of the electronics mission from Dayton with the alternative of consolidating the DLA electronics distribution mission at Dayton. Currently, the DLA electronics distribution mission is primarily split between Dayton, Ohio, and the DLA depot in Ogden, Utah.

2. PURPOSE

To assure that the DLA distribution system provides the best balance of responsive support to its customers and economy of operations.

3. BACKGROUND

a. Previous Studies

When DLA was established in 1962, it inherited a series of military facilities which were not necessarily ideally suited to its needs. It was recognized then that realignment of DLA's facilities would be necessary as missions changed and other DoD facilities became available.

Since 1962, six studies (in 1962, 1963, 1966, 1970, 1971, 1973) of the total DLA distribution system have been made. Each of these studies has concluded that the DESC Depot should be relocated to other DLA Depots.

Two studies of only the electronics distribution system were made by DESC in 1973 and 1976. Both of these studies concluded that a single distribution depot for all electronics items should be established in Ohio (preferably Dayton).

A 1976 Headquarters DLA study of the electronics distribution mission at Dayton recommended relocation of the Dayton Depot to the DLA Depot in Columbus, Ohio. A similar study in 1977 recommended that consideration be given to relocating the Dayton Depot to several other DLA and Military Service Depots. That study resulted in the Director, DLA, announcing the Dayton Depot as a candidate for relocation.

b. The DLA Depot System

Distribution of DLA materiel is handled principally by seven DLA-managed depots assisted by two Navy-managed depots at Norfolk, VA, and Oakland, CA, and one Army-managed depot at New Cumberland, PA.

Seven of the foregoing ten depots - at Columbus, OH; Richmond, VA; Mechanicsburg, PA; Memphis, TN; Ogden, UT; Tracy, CA; and New Cumberland, PA; are classed as Principal Distribution Depots. These depots stock a wide range of DLA material and each depot provides distribution support to all activities within a designated geographical area.

The other three depots - at Dayton, OH; Norfolk, VA; and Oakland, CA; are termed Specialized Support Depots because their functions in either the commodity mission (e.g., Dayton stocks only electronics material) or the distribution mission are highly specialized. The Navy depots serve a limited clientele, e.g., military installations located within a 35-mile limit and Navy fleet and overseas requisitioners.

In addition to these ten depots, DLA positions stock at five Navy maintenance facilities and recruit processing centers that are large-volume users of DLA material.

Current DLA policy regarding stock positioning in at least two depots remains valid (DSAR 4145.5, DSA Material Distribution System, para. III.C.3.a.(5)). In order to be responsive to requisitioners and to achieve dispersion of stocks, fast-moving items must be stored, as a minimum, in one eastern and one western CONUS location.

c. Distribution of DLA Material

The demand for DLA material is concentrated in the coastal states forming a horseshoe pattern from Massachusetts south to Florida, across the Gulf states, through Texas to California and up the Pacific Coast to Washington. This demand includes overseas shipments from CONUS ports. The DLA demand pattern is shown in Figure 1. The demand pattern was developed from the DLA Transportation Movement Analysis of Destination and Commodity (MOWASP F-130) reports submitted by the DLA depots.

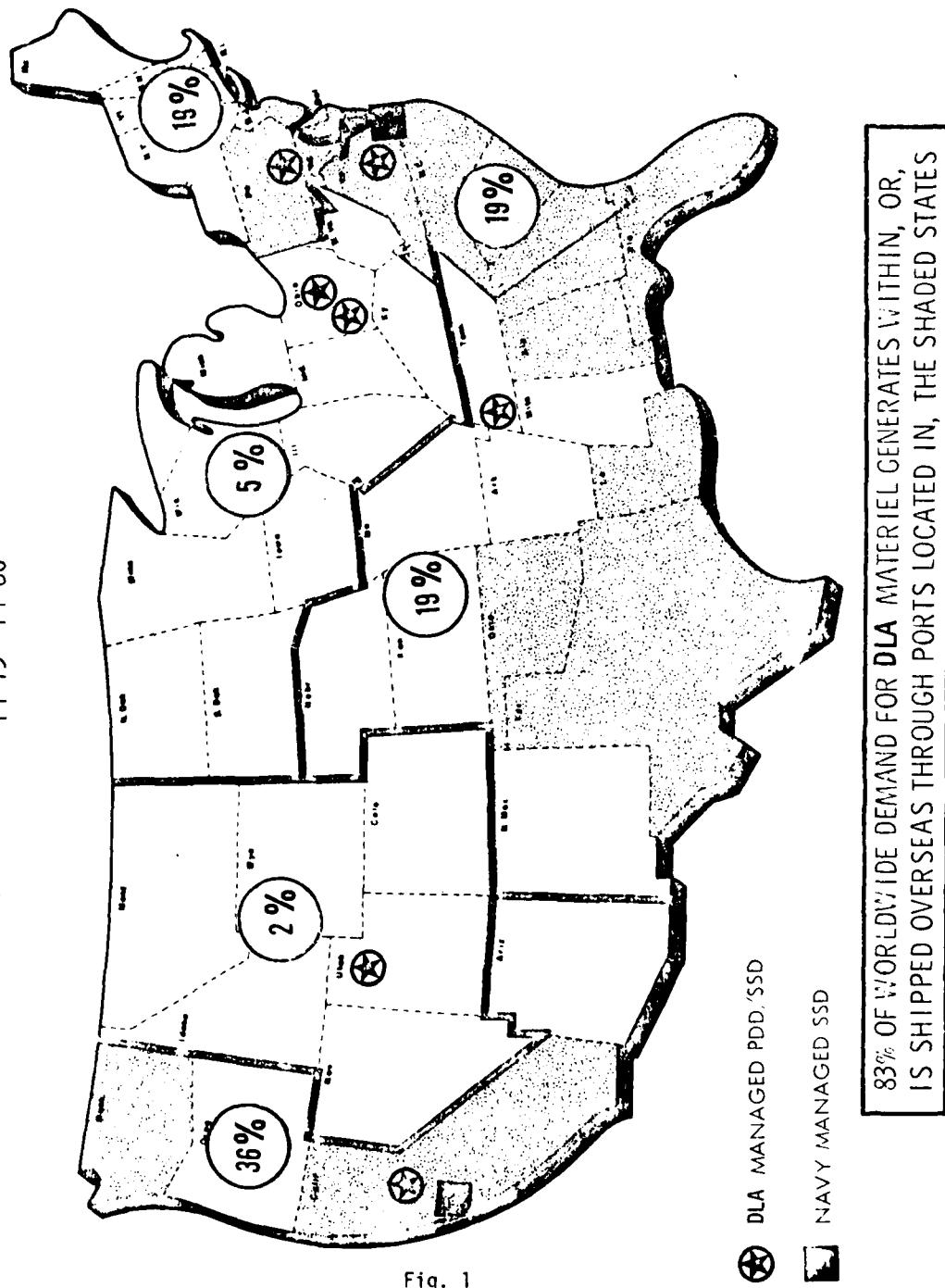
Historical data show that 85% of DLA material is procured from sources east of the Rocky Mountains, primarily from the Northeast and North Central States. Six states account for about 50% of the total DLA procurement. These are: California (12%), New York (10%), New Jersey (9%), Pennsylvania (8%), Illinois (6%) and Ohio (5%).

An analysis of historical data shows that the source of and demand for electronics material is approximately the same as for all DLA material.

Responsiveness to customer demands argues for positioning of stock near the areas of greatest demand. Linear Programming analyses show that

PROJECTED ANNUAL DEMAND FOR DLA MATERIEL BY GEOGRAPHIC DISTRIBUTION AREA

FY 75 - FY 80



the most economic positioning of DLA's material, based on inbound (from source to depot) and outbound (from depot to customer) transportation costs, is in multiple depots near the areas of greatest demand. The proper number and size of depots is a balance between inbound costs, outbound costs and facility operating costs.

DLA manages only four depots located in areas near the greatest demand: i.e., Mechanicsburg, PA; Richmond, VA; Memphis, TN; and Tracy, CA. If only the DLA depot system is considered, all the DLA material should, ideally, be positioned in these four depots. Although some of these depots have excess capability, they do not have the capability to handle all DLA material. Therefore, DLA managers have considered ways to improve the capability of these depots and have considered the use of other DoD depots for the distribution of DLA material.

The conclusions of the studies in paragraph 3.a. regarding relocation of the Dayton Depot were driven by its location relative to customer demand and the available capacity in other DLA depots to absorb the Dayton Depot mission. These analyses considered the degrees to which electronics parts are received and shipped by parcel post.

#### d. The DoD Material Distribution Study (DODMDS)

A DoD study group has been studying the total DoD distribution system to determine the economic and operational feasibility of an integrated DoD depot system, i.e., one system (possibly involving consolidations and modernizations) to serve all DoD needs. The study group is scheduled to complete its analysis in March 1978. Assuming a normal cycle of coordinations and implementing actions, any realignment of DLA depots which may be proposed by the DODMDS could take up to four or five years to accomplish. Nevertheless, any independent realignment of DLA depots should consider potential closure recommendations of the DODMDS.

#### 4. SCOPE

This analysis considered the economic and operational feasibility of relocating only the electronics distribution mission from Dayton to other DLA and DoD depots and from Ogden to Dayton. The reason is as discussed in the background, paragraph 3 above. In brief:

- The Dayton Depot is not ideally located relative to demand.
- The physical size of the Dayton Depot is small enough to be absorbed into one or more other DLA or DoD depots.
- The electronics storage mission at Ogden could be absorbed by the Dayton Depot.
- The volume of workload handled by the Dayton Depot can be absorbed by one or more other DLA or DoD depots.

Relocation of the other DLA depots has not been included in this analysis because:

- Previous studies have shown that no other DLA depots can be absorbed within the DLA system without extensive military construction (MILCON) which would be expensive.
- The DODMDS study is considering principal DoD depots, including all DLA depots, as potential candidates for realignment with other DoD depots. The result could be the relocation of one or more DLA depots.

This analysis considers the transportation costs of the total DLA electronics distribution system as a basis for developing potential alternatives. It also considers all current DoD storage locations of electronics materiel as potential sites for relocation of the Dayton Depot.

While this analysis does not consider the environmental or socio-economic impact of relocating the electronics distribution mission, those factors are examined in a separate analysis. Those factors must be considered with the results of this analysis in making a decision relative to realignment.

## 5. METHODOLOGY

The first step in this analysis was to examine the current DLA electronics distribution mission to determine:

- Demand patterns
- Sources of supply
- Workload
- Resources used
- Operational effectiveness

The second step was to examine other DLA and DoD depots with which the Dayton Depot could potentially be relocated. The capabilities of each of these depots to accept all or part of the Dayton Depot mission was examined. The capability of the Dayton Depot to absorb the Ogden electronics mission was also examined. Criteria used were:

- Location relative to demand
- Space availability
- Processing capability

- Type of storage and distribution currently being done

The third step was to use a linear program (LP) model to determine the assignment of items and workload for various alternatives based on inbound and outbound transportation costs.

The LP assignments were then used as the basis for computing resource requirements at potential gaining activities and the one-time costs of relocation.

A present value analysis of various alternatives was then made. This analysis compared the one-time and recurring cost of each alternative with the current Dayton and Ogden Depot costs.

Finally, an assessment of the operational impact on the customer was made for each alternative.

The changes contained in this revision to the August 1977 study are based upon Defense Audit Service comments. The changes, overall, have minor impact in the analysis.

## 6. ASSUMPTIONS

a. The Army Direct Supply Support System will remain in effect and DLA will be required to position stock for Army overseas shipment at the Army DSS depots or near enough to meet the Army DSS response requirement of two days.

b. The Navy Specialized Support Depot method of operation will remain in effect if no change is made in the current distribution of electronic materiel. If Navy depots become principal distribution depots for DLA materiel, Navy procedures will be changed to accommodate the current DLA system.

c. Transfer of workload from one depot to another will be accomplished by diversion of procurement deliveries over a period of time. Slow-moving and non-moving items will be bulk moved.

## 7. RESULTS

### a. Current Dayton Depot Mission and Resources

The Dayton Depot is part of the Defense Electronics Supply Center (DESC). It is a specialized depot which stocks and distributes only materiel managed by DESC. Dayton is the smallest DLA depot with 377,000 net sq. ft. of available storage space of which 272,000 net sq. ft., or 72% is occupied. Dayton is primarily a "loose issue" operation (i.e., parts are stored loose in unit packs in bins). Issues are made by counting out to appropriate number of unit packs from the materiel in the bins. Over 500,000 storage aid openings (primarily bins) are available. Dayton has a

mechanized capability to receive up to 2,000 line items and ship 8,000 line items per 8-hour shift. It currently received about 1,000 line items and ships 10,000 line items per shift. The difference in mechanized capability and actual shipments is achieved by manual processing.

The Dayton Depot is not well located relative to customer demand. Only 6% of total electronics demand is generated in those states which Dayton can support at a lower outbound transportation cost than other DLA depots (including Columbus which is the same as Dayton from a transportation standpoint).

Figure 2 shows key workload and performance indicators and resource factors for the Dayton Depot.

Figure 2

FY 76 Data

Civilian Personnel <sup>1</sup>	
Depot	563
Support for the Depot	62
 Military Personnel <sup>1</sup>	 4
 O&M Direct Cost <sup>2</sup>	 
Depot	\$8,553,000
Support	646,000
 Line Items Received <sup>3</sup>	 251,400
 Line Items Shipped <sup>5</sup>	 2,553,000
 Items Stocked <sup>4</sup>	 481,179
 On-Time Fill <sup>3</sup>	 95.2%
 Warehouse Denials <sup>3</sup>	 .36%

<sup>1</sup>Position Description Report, 4th Qtr FY 76.

<sup>2</sup>RCS 48 Report, May 1977.

<sup>3</sup>Supply Management Data Report, May 1977. (Shipments exceed receipts because materiel is received in bulk lots from manufacturers or vendors and shipped to military customers in small lots. This is true of all DLA Depots.)

<sup>4</sup>NIR Closing Balance File USSWDS76, 30 Sep 76.

<sup>5</sup>RCS 232 Report, June 1976.

b. Potential Gaining Depots

(1) Richmond, Virginia

The DLA depot at Richmond, VA, is part of the Defense General Supply Center (DGSC). The Richmond Depot is a well located depot in the DLA system because of its proximity to the heavy customer demand in the southeastern and eastern states as well as the ports which ship to overseas customers. For this reason it is considered to be one of the key DLA depots.

The Richmond Depot has a total of 2,646,000 net square feet of available storage space of which 2,118,000 is occupied. This is an occupancy rate of 80% compared to the optimum rate of 85%. The Richmond Depot currently stores general supplies, subsistence, and clothing and textiles.

The Richmond Depot is the least mechanized depot in the system. The current capacity of the mechanized system is 3,500 shipments per 8-hour shift. However, because of its key location, the Richmond Depot is scheduled to be the first DLA depot to receive the Depot Integrated Storage and Retrieval System (DISARS). This mechanization is now underway and will enable the depot to process more than double its current capacity. This will enable DLA to use the Richmond Depot to stock and distribute a full range of DLA materiel.

Under its current system, the Richmond Depot can process about 9,645 issues of bin stored items per manyear. It can process about 2,215 receipts of all types per manyear. Mechanization will improve the overall issue and receipt capacity by 100%.

Richmond currently receives 89,000 and ships 1,124,000 line items per year.

(2) Columbus, Ohio

The DLA depot at Columbus, Ohio, is part of the Defense Construction Supply Center (DCSC). The Columbus Depot is not well located with respect to customer demand. However, it is one of the largest DLA depots in terms of storage capacity. It has a total of 2,792,000 net sq. ft. of available storage space of which 1,992,000 or 71%, is occupied. The Columbus Depot is primarily a "loose issue" (bin) operation with over 400,000 bin openings. It has a total of 676,386 storage aid openings available of which 538,370 or 79% are occupied.

The Columbus Depot stocks and distributes construction, industrial, and industrial plant equipment (IPE). Its mechanized system can receive 3,000 line items and ship 12,000 line items per 8-hour shift. Columbus currently receives 208,500 line items and ships 2,374,000 line items per year.

(3) Memphis, Tennessee

The Memphis Depot is the largest DLA depot in the Eastern United States in terms of workload. It is favorably located relative to customer demand in the South and Southwest. Memphis has 2,463,000 net sq. ft. of storage space of which 2,037,000 sq. ft., or 83%, is occupied. It stocks and distributes a full range of DLA material except for electronics.

The Memphis Depot has a mechanized capability to receive 3,000 line items and ship 10,000 line items per 8-hour shift. It currently receives 301,600 line items and ships 3,199,000 line items per year.

(4) Mechanicsburg, Pennsylvania

The Mechanicsburg Depot is the largest DLA depot in the Eastern United States in terms of storage space. It has 2,982,000 net sq. ft. of available storage space of which 2,657,000, or 89%, is occupied. DLA is a tenant of the Navy at Mechanicsburg.

Mechanicsburg stocks and distributes: clothing and textiles; heavy industrial material; a limited range of general supplies; medical materiel; IPE; and subsistence. It is the Direct Commissary Support (DICOMSS) depot for Europe.

Although it is located in a moderately favorable position relative to customer demand, it has the poorest physical plant in the DLA system. The majority of the storage space is devoted to "bulk" materiel. The majority of bin openings are used for medical materiel.

The Mechanicsburg Depot has a mechanized capability to receive 3,000 line items and ship 3,500 line items per 8-hour shift. Mechanicsburg currently receives 191,500 line items and ships 1,888,000 line items per year.

(5) Ogden, Utah

The Ogden Depot is the largest DLA depot in terms of storage space and workload. It has 3,223,000 net sq. ft. of storage space of which 2,550,000, or 79%, are occupied. Ogden handles a full range of DLA material except for medical items and subsistence. Although it is only moderately well located relative to customer demand, it is the most modern and highly mechanized depot in the DLA system. It has a mechanized capability to receive and ship 20,000 line items per 8-hour shift.

Ogden has most of the DLA bin issue mission west of the Rockies. It has 30% of the bin openings, 50% of the package racks and 25% of the pallet racks in the DLA system. It currently receives 430,700 line items and ships 4,062,000 line items per year.

Figure 3 shows key workload and performance indicators and resource factors for the electronics mission at the Ogden Depot.

Figure 3

FY 76 Data

Civilian Personnel <sup>1</sup>	
Depot	237
Support for the Depot	19
Line Items Received <sup>2</sup>	146,900
Line Items Shipped <sup>3</sup>	1,260,325
Items Stocked <sup>4</sup>	292,349
On-time Fill <sup>5</sup>	96.40%
Warehouse Denials <sup>5</sup>	.65%

<sup>1</sup>Estimated by Defense Depot Ogden.

<sup>2</sup>RCS 232 Report, June 76.

<sup>3</sup>RCS 232 Report, June 76.

<sup>4</sup>Month End Asset File as of 30 Apr 77.

<sup>5</sup>Supply Management Data Report, May 77.

(6) Tracy, California

The Tracy Depot is second only to Ogden in physical size and exceeds Ogden if its Stockton Annex is included. Both facilities together have 3,292,000 net sq. ft. of available storage space of which 2,512,000, or 76%, is occupied.

Tracy is DLA's West Coast depot for heavy construction and industrial items. It also stocks and distributes general, medical, subsistence and IPE. It is the West Coast depot for DICOMSS. Because it is DLA's most favorable Western location relative to customer demand, Tracy is a key depot in the DLA system. Because of its proximity to the Army Depot at Sharpe, CA, (the Army's western DSS depot) it is a prime location for DLA material in support of the Army DSS system. Accordingly, DLA plans are to position material (including electronics) for this purpose at Tracy.

Tracy's mechanized system has the capability to receive 2,500 line items and ship 7,500 line items per 8-hour shift. DLA plans to increase this shipping capacity to 10,500 line items per shift. Tracy currently receives 152,300 line items and ships 1,284,000 line items per year.

(7) Norfolk, Virginia

The Norfolk Depot is part of the Naval Supply Center at Norfolk. It is one of the Navy's key depots. By special agreement, DLA material is positioned at Norfolk in support of the Atlantic Fleet and CONUS activities within a 35-mile radius of Norfolk. Approximately 103,000 DLA electronics items are currently stocked at Norfolk with a capability for substantial increase.

(8) New Cumberland, Pennsylvania

The New Cumberland Depot is one of three Army depots established for Direct Supply Support (DSS) of overseas bases. Overseas shipments, including DLA material, are consolidated at the DSS depots. The Army DSS system requires that shipments from DLA depots to the DSS depots take less than two days. The only DLA depot that can meet this requirement for New Cumberland is Mechanicsburg. Mechanicsburg does not have the space or capability to position electronics and other commodities in support of New Cumberland. Therefore, 1,500 electronics items have been positioned at New Cumberland.

c. Alternatives

(1) Potential Gaining Depots

The depots selected for analysis as potential gainers of the Dayton Depot mission were selected using the criteria in para. 5. They are:

Richmond, VA.  
Norfolk, VA.  
Columbus, OH.  
Ogden, UT.

Richmond and Norfolk are located close to the preponderence of Eastern demand. Richmond has adequate storage space and because of its location is being modernized by DLA to become a "key" depot in the DLA system.

Norfolk already stocks over 100,000 electronics items in support of the Navy fleet. Use of Norfolk to distribute all Eastern demand for those items it now stocks will preclude two stock locations in the East with the attendant duplication of location maintenance costs.

Columbus is not in an ideal location. However, it is as favorable as Dayton, and has adequate storage space and processing capacity to assume part of the Dayton mission. The Columbus Depot is considered in this analysis only as an alternative to Richmond or Norfolk if those depots cannot absorb the Dayton mission assigned by the transportation model.

Ogden is not located as close to large troop concentrations as Tracy. However, Tracy is not currently capable of absorbing the mission now performed by Ogden. Extensive MILCON would be required to relocate the Ogden mission to Tracy. Since Ogden already is the Western storage site for electronics, no new locations would have to be opened. Whatever additional workload is assigned to the West by the transportation model would be absorbed by Ogden.

Memphis and Mechanicsburg are not considered in this analysis because they are operating at or near capacity in terms of storage space or processing capability.

## (2) Selection of Alternatives

The selection of alternative realignments of electronics workload to the potential gaining depots was based on a transportation analysis using linear programming (LP). Nine alternative realignments of workload were compared with the current Dayton, Ogden DLA alignment. Initial LP runs were made without constraints on the geographic boundaries assigned to each depot. The boundaries specified in the nine alternatives approximate the unconstrained "best" boundaries.

<u>Depots</u>	<u>Boundaries</u>
- Norfolk, Richmond and Ogden	Mississippi River
- Norfolk, Richmond and Ogden	Appalachian Mountains
- Norfolk, Richmond and Ogden	Missouri River
- Norfolk, Richmond, Ogden and Columbus	Mississippi River
- Norfolk, Richmond, Ogden and Memphis	Mississippi River
- Norfolk, Richmond and Ogden	Mississippi River
- Norfolk, Richmond, Ogden and Columbus	Missouri River
- Dayton only	None
- Richmond, Ogden and Columbus	Missouri River

Each of these alternatives was structured as opposed to allowing the LP to select the "optimum" alternative. The structuring was based on the criteria in para. 5 (i.e., space availability, processing capability, and extant Service agreements). An unstructured run may have resulted in a solution which is not feasible because of the foregoing criteria. The method used considered all feasible solutions and allows the testing of the sensitivity of alternatives to various realignments. Thus, the optimal "feasible" solution has been included in the LP runs. Details of the LP runs are contained in Appendix A.

(3) Alternatives Costed

(a) Relocate the Dayton Depot mission to Richmond, Norfolk and Ogden. This alternative provides a balance between depot space, processing capabilities, responsiveness to customers through proximity to demand and overall operating cost, including inbound and outbound transportation costs. Under this alternative:

- Norfolk would take over all support for CONUS and overseas customers east of the Mississippi River, now supported by Dayton, for those 134,114 items which Norfolk now stocks or for which Navy is the only user. 909,722 issues now made by Dayton would be transferred to Norfolk. The overseas shipments made by New Cumberland would be excepted.

- Richmond would take over all support for CONUS and overseas customers east of the Mississippi River for the items not stocked at Norfolk. 376,921 items and 1,141,283 issues now made by Dayton would be transferred to Richmond. This electronics commodity workload is the limit which Richmond will be able to process on a single shift in conjunction with other proposed commodity workload with the mechanized complex scheduled to be operational in October 1978. The overseas shipments made by New Cumberland would be excepted. Workload transferred to Richmond prior to October 1978 would have to be processed on a second shift.

- Ogden would take over the support for all customers west of the Mississippi River for those items now stocked at Ogden. 501,995 issues would be transferred to Ogden. Ogden currently supports only those customers west of a line which follows the eastern boundaries of Montana, Wyoming, Colorado and New Mexico.

(b) Relocate the Dayton Depot mission to Richmond, Norfolk, Columbus and Ogden. This alternative would transfer the same workload from Dayton to Norfolk and Ogden as the previous alternative. Richmond would pick up only 146,300 items and 697,458 issues. The remaining 230,621 items and 443,825 issues would be transferred to Columbus. These items are now stocked only at Dayton because of their low demand. Putting them at Columbus would provide support equal to that received from Dayton and, because of their low demand, would not significantly reduce the responsiveness to be gained from a more favorable location.

(c) Relocate the Ogden Electronics mission to Dayton. This alternative is not compatible with the DLA two-location policy and diminishes responsiveness because of Dayton's unfavorable location, particularly with respect to West Coast customers. However, certain economies are inherent in a single location and this alternative was included to determine if such economies outweigh offsetting diseconomies in transportation, total depot system costs and performance. Under this alternative support for all CONUS and overseas customers would be provided by Dayton except the support now provided by Norfolk, Oakland, New Cumberland and the planned support of the Army DSS at Sharpe, CA. 1,260,325 issues would be transferred to Dayton from Ogden under this alternative.

#### (4) Transportation Analysis

A linear programming analysis of the distribution of electronics material was used to determine the workload and transportation costs associated with each depot under each alternative. A detailed description of the methodology and results of this analysis are given in Appendix A. Figure 4 shows the electronics workload which was used as the basis for the transportation analysis. Also shown are the number of items stocked at Dayton which are also stocked at other depots.

Figure 4  
Electronics Workload

<u>Depots at Which Items are Stocked</u>	<u>Items</u>	<u>Line Items Shipped</u>
Dayton	230,621	545,703
Dayton and Norfolk	25,430	147,831
Dayton and Ogden	146,300	857,554
Dayton and Navy Only (not at Norfolk)	19,130	39,350
Dayton, Norfolk, and Ogden	47,714	907,790
Dayton, Navy Only, and Ogden	<u>11,984</u>	<u>23,571</u>
Total Dayton Workload	481,179 <sup>1</sup>	2,521,799 <sup>2</sup>
Total Ogden Workload	292,349 <sup>3</sup>	1,260,325 <sup>4</sup>

Sources: <sup>1</sup>Items: NIR Closing Balance File USSWDS76, 30 Sep 1976

<sup>2</sup>Line Items Shipped: DESC Issue Transaction Data, FY 76  
Adjusted to agree with RCS 232 Report, June 76, in  
developing workload to be transferred.

<sup>3</sup>Items: Month End Asset File, 30 Apr 77

<sup>4</sup>Line Items Shipped: RCS 232 Report, June 76

d. Costs

(1) General

Both one-time costs and net recurring differences in costs were computed for each alternative. One-time costs are those out-of-pocket expenses incurred by the Government to make the relocation. Recurring net differences are the differences between the current operating costs and the operating costs after realignment.

Certain general assumptions and factors were used in computing the costs associated with each alternative.

(a) Assumptions:

1. Stock would be transferred from the Dayton Depot to the gaining depot in twelve equal increments starting at decision day plus three months. Figure 5 shows the schedule of transfers.

2. Workload would be transferred from Ogden to Dayton over a three-year time period. Residual stocks would be transferred at the end of three years.

3. No military construction (MILCON) will be required for any alternative in this study.

4. Any equipment which could be released by a losing depot but not needed by a gaining depot will be used to replace older in-use DLA equipment or sent to disposal. Any proceeds from disposal will just offset the cost of disposal resulting in a zero net cost.

5. All costs were developed based on a 1 Oct 77 decision date.

(b) Factors:

1. 18.1% was added to base salaries to account for government benefits, in accordance with the Office of Management and Budget (OMB) directives.

2. Base salaries were derived from the DLA FY 77 O&M Guidance, Feb 1977. (NOTE: The O&M Guidance contains 9% for government benefits.)

(2) One-time Costs. These are the one-time costs to implement the proposed plan(s).

(a) Personnel. These are the costs associated with the transfer or termination of current employees at the losing activity and the hiring and training of new employees at the gaining activities.

**FIGURE 5**  
**TIME-PHASED PLAN FOR TRANSFER OF STOCK**

D-DAY	MONTHS													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
3>														

3> 2> 1> 4>

- D- System Changes D-Day
- 1> Disposal D + 6 Months
- 2> Equal Increments Relocated D + 4 through 15 Months
- 3> Ship No/Low Demands First - Highest Demands Last
- No Procurement Workload
- 4> Gainers Receiving Stock no Later Than D-Day + 9 Months
- Ship Bin Boxes - No Outbound Count - No Inbound Inspection/Count

1. Moving Cost. The average cost to move an employee to a new duty station was estimated to be \$6,147 based on historical data.

2. Termination Cost. The estimated cost to separate an employee (severance pay) is \$6,575 based on historical data. The termination cost is applicable to all those employees who would leave the government, excluding retirements, because their jobs were either abolished or transferred.

3. Training Cost. The estimated cost for formal training is \$244 per person. This cost is applicable to the number of personnel spaces to be transferred less the number of employees transferring.

4. Advance Hire Cost. This cost is for new employees hired at the gaining depots one month in advance of actual workload transfers for the purpose of training. This assumes that new employees are non-productive during the training period and are fully productive at the end. In fact new employees will have low productivity initially; will rapidly progress to a moderate level of productivity; and then taper off in the rate of increased productivity until they are fully productive nine months after employment. The method of costing advance hires is intended to approximate the loss of productivity during a new employee's first nine months.

5. ADP. These are the costs of programming changes.

(b) Equipment. These are the costs associated with acquiring equipment at the gainers or moving equipment from the losing activities to the gaining activities.

1. Office Equipment. These are the costs of moving office type equipment from the losing activities to the gaining activities. This cost was estimated to be \$0.60 per square foot of administrative space. For each administrative or supervisory space transferred, an average of 120 square feet was used.

2. Storage Aids. These are the costs of acquiring or moving and setting up storage aids at the gaining activities.

3. MHE/MMHS. These are the costs of moving material handling equipment from the losing activities to the gaining activities.

(c) Relocation of Bulk Stock. This is the cost of moving stock from the losing activities to the gaining activities. This cost includes the pulling, packing, banding and loading at the losing activities, transportation to the gaining activities, receiving and putting away at the gaining activity, and new bins and rewarehousing.

(d) Communications. These are the costs of acquiring, moving and installing voice and digital communications at the gaining

activities. No appreciable communications costs were projected for any of the alternatives.

(e) Building Closure. These are the costs involved in closing down a building.

(3) Recurring Net Cost Differences. These are the recurring net differences between current and future operations expected to result from the alternative plans.

(a) Personnel. These are the salaries of the spaces that will be eliminated under each alternative. These spaces are the difference between the current losing activity strength in the depot and supporting functions and the sum of the spaces that will be retained and the spaces that will be transferred to the gaining activity.

(b) Shift Differential. This is the cost of premium salary paid to the second and third shift workers.

(c) Non-Personnel. These are the differences in ADP, communications and other support operations (e.g., utilities) which are expected to result from each alternative.

1. ADP. This is the difference in ADP operating costs between the current DLA depot configuration and the configuration under each alternative.

2. Communications. No appreciable change in communications costs was projected for any of the alternatives.

3. Other. These are the non-labor reductions in the support functions.

(d) Transportation. This is the sum of the inbound (from vendor to the depots) and outbound (from the depots to the military customer) transportation costs for each alternative. This cost is computed using the methodology delineated in Appendix A.

(e) Building Closure. These are the costs of maintaining closed buildings.

e. Present Value Analysis

A present value comparison of the one-time costs and recurring savings was made for each alternative. In addition, the sensitivity of the outcome of the first alternative was tested using different one-time and recurring costs furnished by DESC. The present value analyses for each alternative show the following results:

(1) Alternative 1. Relocate the Dayton Depot to Richmond, Ogden and Norfolk.

Figure 6 shows a net one-time cost of \$3.858 million discounted to a present value of \$3.626 million. Detailed computations of these costs are shown in Appendix B.

Figure 7 shows a net recurring savings of \$3.131 million per year after the relocation is fully implemented. Over a seven-year life, the savings total \$19.412 million, discounted to a present value of \$13.616 million. Detailed computations of these savings are shown in Appendix B.

Figure 8 shows a net one-time cost of \$4.801 million using data furnished by DESC. This one-time cost discounts to a present value of \$4.512 million. Detailed computations of these costs are shown in Appendix C.

Figure 9 shows a net recurring savings of \$2.611 million per year using data furnished by DESC. Over a seven-year life these savings total \$16.128 million discounted to a present value of \$11.300 million.

The cumulative net recurring savings for Alternative 1 exceed the one-time costs during FY 1980. Using the data furnished by DESC the cumulative savings exceed the one-time costs by the end of FY 1980. A comparison of costs and savings is graphically illustrated in Figure 10.

(2) Alternative 2. Relocate the Dayton Depot to Richmond, Ogden, Columbus and Norfolk.

Figure 11 shows a net one-time cost of \$3.804 million discounted to a present value of \$3.575 million. Detailed computations of these costs are shown in Appendix D.

Figure 12 shows a net recurring savings of \$3.118 million per year after relocation is fully implemented. Over a seven-year life the savings total \$19.397 million discounted to a present value of \$13.620 million. Detailed computations of these savings are shown in Appendix D.

The cumulative net recurring savings for Alternative 2 exceed the one-time costs by the end of FY 80.

(3) Alternative 3. Relocate the Electronics Mission at Ogden to Dayton.

Figure 13 shows a net one-time cost of \$1.216 million, discounted to a present value of \$1.000 million. Detailed computations are shown in Appendix E.

Figure 6

Alternative 1. Relocate the Dayton Depot to Richmond, Ogden and Norfolk

## ONE-TIME COSTS (\$000)

COST ELEMENT	FISCAL YEAR			TOTAL
	1978	1979	1980	
Personnel Costs				
a. Moving	138	28	--	166
b. Terminations	844	169	--	1,013
c. Training	86	17	--	103
d. Advance Hire	485	96	--	581
e. ADP	12	--	--	12
Equipment Costs				
a. Office Equipment	4	--	--	4
b. Storage Aids/ Rewarehousing	30	--	--	30
c. MHE/MMHS	9	--	--	9
Relocation of Bulk Stock	1,571	314	--	1,885
Building Closures	55	--	--	55
<b>TOTAL</b>	<b>3,234</b>	<b>624</b>	<b>--</b>	<b>3,858</b>
Discount Factor	0.954	0.867	0.788	--
Discounted Cost	3,085	541	--	3,626
Cum. Disc. Cost	3,085	3,626	3,626	--

Alternative 1. Relocate the Dayton Depot to Richmond, Ogden and Norfolk

Figure 7

NET DIFFERENTIAL SAVINGS (\$000)

COST ELEMENT	FISCAL YEAR					TOTAL
	1978	1979	1980	1981	1982	
Personnel	893	2,798	2,857	2,857	2,857	2,857
2nd Shift Differential	(89)	(65)	--	--	--	--
Non-Personnel						(154)
a. ADP	(21)	45	41	41	41	229
b. Telecom.	--	--	--	--	--	--
c. Other	--	120	120	120	120	720
Transportation	--	112	149	149	149	857
Building Closures	--	(36)	(36)	(36)	(36)	(216)
<b>TOTAL</b>	<b>783</b>	<b>2,974</b>	<b>3,131</b>	<b>3,131</b>	<b>3,131</b>	<b>19,412</b>
<b>Discount Factor</b>	<b>0.954</b>	<b>0.867</b>	<b>0.788</b>	<b>0.717</b>	<b>0.652</b>	<b>0.592</b>
<b>Discount Savings</b>	<b>747</b>	<b>2,578</b>	<b>2,467</b>	<b>2,245</b>	<b>2,041</b>	<b>1,854</b>
<b>Cum. Disc. Savings</b>	<b>747</b>	<b>3,325</b>	<b>5,792</b>	<b>8,037</b>	<b>10,078</b>	<b>11,932</b>
						<b>13,616</b>
						<b>--</b>

Values in parenthesis are net costs and should be subtracted.

Figure 8

Alternative 1a. Relocate the Dayton Depot to Richmond, Ogden and Norfolk  
(DESC Data)

## ONE-TIME COSTS (\$000)

COST ELEMENT	FISCAL YEAR			TOTAL
	1978	1979	1980	
Personnel Costs				
a. Moving	148	30	--	178
b. Terminations	838	168	--	1,006
c. Training	92	18	--	110
d. Advance Hire	514	103	--	617
e. ADP	12	--	--	12
Equipment Costs				
a. Office Equipment	4	--	--	4
b. Storage Aids/ Rewarehousing	30	--	--	30
c. MHE/MMHS	9	--	--	9
Relocation of Bulk Stock	2,317	463	--	2,780
Building Closures	55	--	--	55
<b>TOTAL</b>	<b>4,019</b>	<b>782</b>	<b>--</b>	<b>4,801</b>
Discount Factor	0.954	0.867	0.788	--
Discounted Cost	3,834	678	--	4,512
Cum. Disc. Cost	3,834	4,512	4,512	--

Alternative 1a. Relocate the Dayton Depot to: Richmond, Ogden and Norfolk  
(DESC Data)

NET DIFFERENTIAL SAVINGS (\$000)

COST ELEMENT	FISCAL YEAR					1984	TOTAL
	1978	1979	1980	1981	1982		
Personnel	738	2,312	2,361	2,361	2,361	2,361	14,855
2nd Shift Differential	(100)	(73)	--	--	--	--	(173)
Non-Personnel	(21)	45	41	41	41	41	229
a. ADP	--	--	--	--	--	--	--
b. Telecom.	--	96	96	96	96	96	576
c. Other	--	112	149	149	149	149	857
Transportation	--	(36)	(36)	(36)	(36)	(36)	(216)
Building Closures	617	2,456	2,611	2,611	2,611	2,611	16,128
<b>TOTAL</b>	<b>0.954</b>	<b>0.867</b>	<b>0.788</b>	<b>0.717</b>	<b>0.652</b>	<b>0.592</b>	<b>0.538</b>
Discount Factor	589	2,129	2,057	1,872	1,702	1,546	1,405
Discount Savings	589	2,718	4,775	6,647	8,349	9,895	11,300
Cum. Disc. Savings	589	2,718	4,775	6,647	8,349	9,895	11,300

Values in parenthesis are net costs and should be subtracted.

FIGURE 10

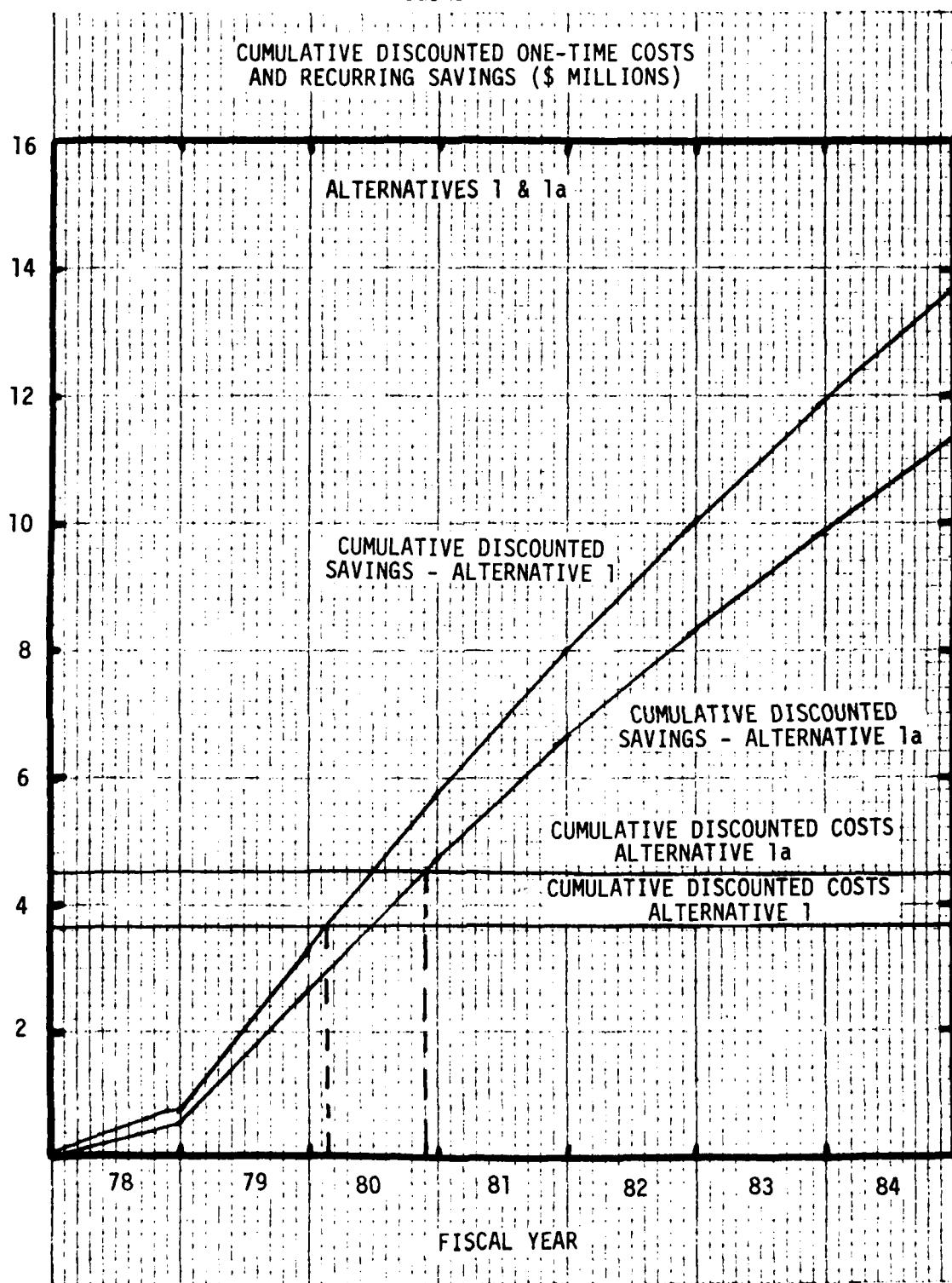


Figure 11

Alternative 2. Relocate the Dayton Depot to Richmond, Ogden, Columbus and Norfolk

ONE-TIME COSTS (\$000)

COST ELEMENT	FISCAL YEAR			TOTAL
	1978	1979	1980	
Personnel Costs				
a. Moving	159	32	--	191
b. Terminations	844	169	--	1,013
c. Training	85	17	--	102
d. Advance Hire	481	95	--	576
e. ADP	12	--	--	12
Equipment Costs				
a. Office Equipment	4	--	--	4
b. Storage Aids/ Rewarehousing	30	--	--	30
c. MHE/MMHS	9	--	--	9
Relocation of Bulk Stock	1,510	302	--	1,812
Building Closures	55	--	--	55
<u>TOTAL</u>	<u>3,189</u>	<u>615</u>	--	<u>3,804</u>
Discount Factor	0.954	0.867	0.788	--
Discounted Cost	3,042	533	--	3,575
Cum. Disc. Cost	3,042	3,575	3,575	--

Alternative 2. Relocate the Dayton Depot to Richmond, Ogden, Columbus and Norfolk

Figure 12

NET DIFFERENTIAL SAVINGS (\$000)

COST ELEMENT	FISCAL YEAR					TOTAL
	1978	1979	1980	1981	1982	
Personnel	893	2,798	2,857	2,857	2,857	2,857
2nd Shift Differential	(54)	(40)	--	--	--	--
Non-Personnel	(21)	45	41	41	41	41
a. ADP	--	--	--	--	--	--
b. Telecom.	--	120	120	120	120	120
c. Other	--					
Transportation	--	102	136	136	136	136
Building Closures	--	(36)	(36)	(36)	(36)	(36)
						(216)
<b>TOTAL</b>	<b>818</b>	<b>2,989</b>	<b>3,118</b>	<b>3,118</b>	<b>3,118</b>	<b>3,118</b>
<b>Discount Factor</b>	<b>0.954</b>	<b>0.867</b>	<b>0.788</b>	<b>0.717</b>	<b>0.652</b>	<b>0.592</b>
<b>Discount Savings</b>	<b>780</b>	<b>2,591</b>	<b>2,457</b>	<b>2,236</b>	<b>2,033</b>	<b>1,846</b>
<b>Cum. Disc. Savings</b>	<b>780</b>	<b>3,371</b>	<b>5,828</b>	<b>8,064</b>	<b>10,097</b>	<b>11,943</b>
						<b>13,620</b>
						<b>--</b>

Values in parentheses are net costs and should be subtracted.

Figure 13

## Alternative 3. Relocate the Ogden Electronics Mission to Dayton

## ONE-TIME COSTS (\$000)

COST ELEMENT	FISCAL YEAR			TOTAL
	1978	1979	1980	
Personnel Costs				
a. Moving	23	23	23	69
b. Terminations	140	140	140	420
c. Training	--	--	--	--
d. Advance Hire	--	--	--	--
e. ADP	12	--	--	12
Equipment Costs				
a. Office Equipment	--	--	--	--
b. Storage Aids/ Rewarehousing	--	--	--	--
c. MHE/MMHS	--	--	--	--
Relocation of Bulk Stock	--	--	715	715
Building Closures	--	--	--	--
TOTAL	175	163	878	1,216
Discount Factor	0.954	0.867	0.788	--
Discounted Cost	167	141	692	1,000
Cum. Disc. Cost	167	308	1,000	--

Figure 14 shows a net recurring cost of \$.276 million per year after relocation is fully implemented. Over a seven-year life the costs total \$1.518 million, discounted to a present value of \$1.034 million. Detailed computations of these costs are shown in Appendix E.

f. Sensitivity Analysis

Because of the lack of precise historical data regarding relocation costs and comparative operating costs, many of the costs used in this analysis are estimates based on management and engineering judgments. Large errors in the estimates could have a significant effect on the outcome of the analysis. Therefore, the sensitivity of the outcome was tested to determine how large an error would be needed to change the outcome.

The DESC estimates of one-time costs are 24% greater than the DLA estimates. This difference does not change the outcome in terms of the break-even year. The DESC estimates of savings are 20% less than the DLA estimates. This difference does not change the outcome. Both these differences taken together do not change the outcome.

The one-time costs would have to be increased by 60% to move the break-even year from FY 80 to FY 81 for Alternatives 1 and 2, assuming the estimated savings are accurate. The savings for Alternatives 1 and 2 would have to be reduced by 40% to move the break-even year from FY 80 to FY 81, assuming the estimated one-time costs are accurate. The personnel savings would have to be reduced by 50% to change the break-even year from FY 80 to FY 81 for Alternatives 1 and 2.

Combined errors of 25% in both the estimated one-time costs (underestimated by 25%) and recurring savings (overestimated by 25%) would be required to change the break-even year from FY 80 to FY 81 for Alternatives 1 and 2.

g. Customer Support Impact if the Dayton Depot Mission is Relocated

Relocating the Dayton depot mission will cause some degradation in logistics support to DLA customers. Although the degradation cannot be quantified it can be minimized. Currently, electronic items are positioned at Dayton, OH, New Cumberland, PA, Norfolk, VA, Ogden, UT, and Oakland, CA.

Bulk relocation planning requires that no/least demanded items be moved first and fast/most demanded items be moved last. It is projected that the bulk location effort can be completed within a 12/15 month time-frame.

New procurements/customer excesses generated after "D" day would be directed to the applicable gaining activity. Since DESC has an average procurement lead time of nine months, gaining activities would be

Alternative 3. Relocate the Ogden Electronics Mission to Dayton

Figure 14

NET DIFFERENTIAL SAVINGS (\$000)

COST ELEMENT	1978	1979	1980	FISCAL YEAR			1984	TOTAL
				1981	1982	1983		
Personnel	85	252	421	506	506	506	506	2,782
2nd Shift Differential	(12)	(36)	(61)	(73)	(73)	(73)	(73)	(401)
Non-Personnel	--	--	--	--	--	--	--	--
a. ADP	--	--	--	--	--	--	--	--
b. Telecom.	--	--	--	--	--	--	--	--
c. Other	3	9	15	18	18	18	18	99
Transportation	(121)	(363)	(606)	(727)	(727)	(727)	(727)	(3,998)
Building Closures	--	--	--	--	--	--	--	--
<b>TOTAL</b>	<b>(45)</b>	<b>(138)</b>	<b>(231)</b>	<b>(276)</b>	<b>(276)</b>	<b>(276)</b>	<b>(276)</b>	<b>(1,518)</b>
Discount Factor	0.954	0.867	0.788	0.717	0.652	0.592	0.538	--
Discount Savings	(43)	(120)	(182)	(198)	(180)	(163)	(148)	(1,034)
Cum. Disc. Savings	(43)	(163)	(345)	(543)	(723)	(886)	(1,034)	--

Values in parenthesis are net costs and should be subtracted.

receiving stock and thus be in a position to render customer support during the same time-frame that bulk move stocks were intransit from Dayton. Conversely, it is recognized that some items will not be in a buy position and customer demands will be received while Dayton depot stocks are intransit. However, this situation is not anticipated to cause any significant customer support impact because stocks already positioned at New Cumberland, Norfolk, Ogden and Oakland can be used to satisfy customer demands during the stock transit time-period.

h. Performance Evaluation

Figure 15 gives a historical comparison of the performance of each DLA depot as measured by DLA's key depot performance indicators. These indicators show that all of the DLA depots are nearly identical in performance and all exceed or are near the established DLA goals.

Figure 16 gives a comparison of the performance of the DLA and Military Service depots considered in this analysis.

The Navy depots' relatively poor performance data is due, in part, to the method used to post and count receipts and shipments of DLA material. If the Norfolk depot is made a principal distribution depot for DLA electronics material, its system will be changed.

i. Other Considerations. These are areas which warrant consideration in arriving at any conclusion. Some of these areas have been costed, however, they are not considered to be as significant as those items shown in the costing sections.

(1) Duplicate Locations. These are the savings that will accrue if a duplicate stock location is closed. The savings are an avoidance of the additive cost charged by a supplier for shipping to more than one location. The personnel costs associated with duplicate locations are included under personnel. The cost of a duplicate shipment is estimated to average \$20.66 for DLA based on data obtained from DESC and DCSC. These are savings in stock fund money, not operations and maintenance appropriations. The split shipment savings for Alternatives 1, 1a and 2 are \$351,000 per year after the total transfer has taken place. The savings for Alternative 3 are \$1,091,000 per year after the total transfer has taken place. The Defense Audit Service was unable to validate our duplicate shipment estimate of \$20.66.

(2) Wage Board Differentials. The wage board rates at DESC are higher than at any of the other locations under consideration. These higher wage board rates, if included, would increase the savings for Alternatives 1, 1a and 2 (\$500,000 - \$600,000 per year), and increase costs for Alternative 3 (\$250,000 per year).

(3) Cost Avoidances. Figure 17 lists the improvement projects planned for the Dayton Depot. If the Dayton Depot is relocated to other

**FIGURE 15**  
**DLA DEPOT COMPARISON PERFORMANCE DATA**

1. On-Time Processing of Receipts (%) DLA Goal 95%							DESC Ranking		
	<u>DLA</u>	<u>DCSC</u>	<u>DESC</u>	<u>DGSC</u>	<u>DDMP</u>	<u>DDMT</u>	<u>DDOU</u>	<u>DDTC</u>	<u>DESC Ranking</u>
FY-76	95.2	96.1	97.5	95.1	97.7	89.6	95.4	97.5	2
FY-77	97.5	96.0	98.0	96.1	99.2	96.4	98.1	98.5	4
(Apr)	97.2	96.6	95.7	95.6	98.9	97.1	98.0	97.4	6
2. On-Time Processing of MROs (%) DLA Goal - None Overall							DESC Ranking		
	<u>DLA</u>	<u>DCSC</u>	<u>DESC</u>	<u>DGSC</u>	<u>DDMP</u>	<u>DDMT</u>	<u>DDOU</u>	<u>DDTC</u>	<u>DESC Ranking</u>
FY-76	91.2	92.8	95.2	96.4	89.9	76.8	96.3	97.6	4
FY-77	89.0	85.2	89.8	97.4	94.6	82.0	97.3	96.8	5
(Apr)	88.2	86.2	88.1	94.7	95.9	81.3	98.1	95.9	4
3. Material Denials (%) DLA Goal 0.9%							DESC Ranking		
	<u>DLA</u>	<u>DCSC</u>	<u>DESC</u>	<u>DGSC</u>	<u>DDMP</u>	<u>DDMT</u>	<u>DDOU</u>	<u>DDTC</u>	<u>DESC Ranking</u>
FY-76	.74	1.13	.36	.85	.79	.78	.65	.77	1
FY-77	.82	1.03	.38	.88	.78	1.34	.60	.83	1
(Apr)	.84	.90	.44	.88	1.13	1.13	.59	.88	1
4. Locator Accuracy (%) DLA Goal 99%							DESC Ranking		
	<u>DLA</u>	<u>DCSC</u>	<u>DESC</u>	<u>DGSC</u>	<u>DDMP</u>	<u>DDMT</u>	<u>DDOU</u>	<u>DDTC</u>	<u>DESC Ranking</u>
FY-76	98.6	98.8	98.3	95.9	97.3	96.6	99.7	98.8	5
FY-77	98.1	97.4	97.8	97.0	99.6	95.8	99.7	99.0	4
(Apr)	98.2	98.7	97.9	98.5	99.6	90.7	99.6	98.8	5

**FIGURE 16**  
**PERFORMANCE COMPARISON OF SELECTED DLA AND MILITARY SERVICE DEPOTS**

<u>DATA ELEMENT</u>	<u>DCSC<sup>3</sup></u>	<u>DESC<sup>3</sup></u>	<u>DGSC<sup>3</sup></u>	<u>DDOU<sup>3</sup></u>	<u>NORFOLK<sup>1</sup></u>	<u>OAKLAND<sup>1</sup></u>
NSNs in Store	300,000 <sup>2</sup>	466,576	92,000	633,000	268,637	313,841
Line Items Received	208,500	251,400	89,100	430,700	83,659	68,269
% Processed On-time	96.2	97.5	95.2	95.5	97.4	91.1
Line Items Shipped	2,374,000	2,553,000	1,124,000	4,062,000	208,700 <sup>4</sup>	268,000 <sup>4</sup>
% Processed On-time	92.8	95.2	96.4	96.4	49.2	76.1
% Warehouse Denials	1.13	.36	.85	.65	5.6	3.6
Locator Record Accuracy (%)	98.8	98.3	95.8	99.7	N/A	N/A

<sup>1</sup>FY 77 Data Oct-Mar - Source: RCS 26

<sup>2</sup>Includes IPE - Source: RCS 26

<sup>3</sup>FY 76 Data - Source: RCS 232

<sup>4</sup>Includes only MROs received from Supply Centers. Norfolk and Oakland processed an additional 474,672 and 222,454 local issues, respectively.

FIGURE 17  
COST AVOIDANCES AT THE DAYTON DEPOT

A. Mechanization of the Dayton Depot (FY 79)	\$3,100,000
B. Military Construction Projects	
1. FY 1976 Mechanized Receiving/Shipping Equipment Support	\$ 96,000
2. FY 1981 Modify Perimeter Walls - Buildings 2 and 4	<u>293,000</u>
Subtotal	\$ 389,000
C. Minor Construction Projects - Various Depot Facility Modifications (per year)	\$ 10,000
Subtotal	<u>\$ 10,000</u>
D. FY 1977 O&M (Local)	
1. Office Excellence, Building 2	\$ 220,000
2. Portable Warehouse Administrative Office - 5 @ \$10,000	50,000
Subtotal	<u>\$ 270,000</u>
E. ADPE	
Effective 1 Feb 1978, current receiving teleprocessing equipment (annual cost of \$4,584) will be replaced by Sanders (CRT) Equipment at an annual rental cost of \$16,320.	
F. Totals	
One-time Cost Avoidance	\$3,759,000
Recurring Cost Avoidance	21,736

depots these projects will not be needed. Since these projects have not yet been funded, and may never be funded or accomplished even if the Dayton Depot is not relocated, their cost has not been included as a savings in this analysis.

(4) Changes in Central Procurement and Stockage Policies. Several projects regarding central procurement and stockage are underway in DLA in response to directives from the Office of Federal Procurement Policy (OFPP) in the OMB. These projects, which could significantly reduce the number of items stocked in DLA's depots, are:

(a) Commercial Commodity Acquisition Program (CCAP). This project is aimed at reducing the number of defense items bought using military specifications. If items now purchased on specifications (as many of DESC's items are) are determined to be commercially available without specifications, then such items would be susceptible to local purchase, thus, eliminating them from DLA's depots.

(b) Commercial Item Support Program (CISP). The CISP is an OMB program designed to determine the most cost effective level of supply management by considering centralization of each primary function of the acquisition process and the use of the most practical procurement alternative in supporting the supply management decision. This project is aimed at reducing the number of items centrally procured and stocked by the Defense Department. A pilot project is underway in DLA to determine those items that can be locally purchased and obtained through commercial distribution systems. This project could significantly reduce the number of items stocked and issued by DLA depots.

(5) Contractor Operated Civil Engineering Supply Stores (COCESS). This project is aimed at expanding the COCESS concept now in use by the Military Services. It would permit Military Bases to obtain civil engineering supplies through contractor stores rather than through the Defense logistics system. Expansion of the concept would reduce the number of items stocked and issued by DLA depots.

#### (6) Item Management Coding (IMC)

There are 604 Federal Supply Classes (FSCs) identified under the Federal Catalog Program. 403 FSCs are assigned for integrated management, 331 by DLA. Approximately 600,000 consumable items in these FSCs are under a Weapons System Integrated Materiel Manager (WIMM). There are approximately 720,000 consumable items in the other 201 FSCs which are under a WIMM but have not been subjected to Item Management Coding (IMC).

The OASD(MRA&L) has proposed that IMC be applied to the consumable items in the 201 WIMM FSCs and that revised IMC criteria be applied to all 604 FSCs. These actions could result in DLA being assigned integrated management for a high proportion of these items. Some of these

items are electronic parts which could mean an increase in storage requirements and workload for the depots included in this analysis.

(7) The DoD Materiel Distribution Study (DODMDS). As indicated in paragraph 3d, p. 4, the DODMDS is examining 34 DoD depots, both DLA and Military Service operated, with a view towards optimal realignment. The preliminary findings of DODMDS are consistent with the alternatives in this analysis.

## 8. CONCLUSIONS

a. It is economically and operationally feasible to relocate the Dayton Depot to other DLA and DoD depots. A summary of the one-time costs and the recurring personnel and dollar savings for each alternative is shown in Figure 18.

b. Relocation of the Dayton Depot to the depots at Richmond, Ogden and Norfolk, as examined in Alternative 1 of the analysis, will cost approximately \$3.9 million to implement and will result in a net reduction in annual operating costs of about \$3.1 million. If the duplicate location savings are considered there would be an approximately \$.4 million additional annual savings in the stock fund for an overall \$3.5 million annual savings. Even if the higher implementation costs of \$4.8 million and lower annual savings of \$2.6 million (\$3.0 million including duplicate locations) estimated using the DESC data are considered, the relocation is economically feasible. The additional consideration of the cost avoidances (\$3.8 million) and the Wage Board Differentials (\$.6 million) make this alternative more economically attractive.

c. Relocation of the Dayton Depot to the depots at Richmond, Ogden, Columbus and Norfolk, as examined in Alternative 2, will cost approximately \$3.8 million to implement and will result in a net reduction in annual operating cost of about \$3.1 million. If the duplicate location savings are considered there would be an approximately \$.4 million annual savings in the stock fund for an overall \$3.5 million annual savings. The additional consideration of the Cost Avoidances (\$3.8 million) and the Wage Board Differentials (\$.5 million) makes this alternative more economically attractive. There is no economic difference between this alternative and Alternative 1.

d. Relocation of the Ogden electronics mission to Dayton will cost approximately \$1.2 million and will result in annual costs of approximately \$.3 million. If the duplicate location savings are considered there would be an approximately \$1.1 million annual savings in the stock fund for an overall \$.8 million annual savings. This alternative becomes economic with the inclusion of the duplicate location savings. However, even considering the duplicate locations, the total savings are not as significant as the other two alternatives (with or without duplicate location savings) considered. The consideration of the \$.3 million Wage Board Differential increase for this alternative would make it less economically

FIGURE 18  
SUMMARY OF COSTS AND SAVINGS (\$ THOUSANDS)

	ALTERNATIVES		
	1	1a	2
	<u>Relocate Dayton to Richmond, Ogden &amp; Norfolk</u>	<u>Relocate Dayton to Richmond, Ogden &amp; Norfolk (DESC Data)</u>	<u>Relocate Dayton to Richmond, Ogden, Columbus &amp; Norfolk</u>
Personnel Transfers to Gainers	449	478	449
Personnel Reductions	167	137	167
One-Time Costs (\$000)	3,858	4,801	3,804
Personnel	(1,875)	(1,923)	(1,894)
Equipment	(43)	(43)	(43)
Bulk Move	(1,885)	(2,780)	(1,812)
Building Closure	(55)	(55)	(55)
Annual Savings (\$000)	3,131	2,611	3,118
Personnel	(2,857)	(2,361)	(2,857)
Non-Personnel	(274)	(250)	(261)
Cumulative Discounted One-Time Costs (\$000)	3,626	4,512	3,575
Cumulative Discounted Seven-year Savings (\$000)	13,616	11,300	13,620
			-1,034

attractive. The savings which can be realized do not appear to warrant changing DLA's policy regarding stockage of fast-moving items.

e. Operational effectiveness will not be affected in the long run by any of the alternative realignments. There will be some turbulence while relocation is taking place. This may be particularly so in the case of Norfolk since they must change from the Navy to the DLA system. The method of transferring stock will minimize degradation in customer support.

f. The realignments examined in this analysis are consistent with the preliminary findings of the DODMDS. Relocation of the DESC Depot mission prior to DODMDS is justified because the cost of relocation will be recovered before implementation of the DODMDS.

g. Separation of the Dayton Depot from DESC will leave over two-thousand people at the installation. However, they will occupy less than 25% of the available space. The vacated space could be used by DLA or other government organizations.

h. Although relocation of the Dayton Depot is economically feasible for the Defense Department, any decision regarding relocation must consider the environmental and socioeconomic impact on the losing and gaining communities. Those impacts are examined in a separate analysis.

APPENDIX A  
ELECTRONICS DISTRIBUTION STUDY  
LINEAR PROGRAMMING ANALYSIS

A. OBJECTIVES

The objectives of this analysis were:

1. To determine from a set of alternatives the most transportation cost effective locations for the Electronics Depot mission now located at Dayton, Ohio.
2. To determine the transportation cost of consolidating the electronics distribution mission at Dayton, Ohio.

B. BACKGROUND AND APPROACH

1. The analysis was performed in support of a review of the economic and operational feasibility of relocating the DLA electronics distribution mission.
2. Analysis centered around testing several alternative Electronics Depot scenarios with a linear programming (LP) model. The LP model worked only with inbound and outbound transportation costs.
3. Item assignment in the depot scenario was based on the premise that there would be only one depot location in the East for any item.

C. METHODOLOGY

1. The general methodology was to use an LP model to compute total transportation costs for various depot scenarios. A total of ten LP runs were made covering different scenarios. Line items received and shipped served as the basis for developing costs, depot constraints, and percentages used in the LP runs.

The LP model is mathematically formulated as follows:

Minimize

$$[1] \quad Z = \sum_{i} \sum_{j} \sum_{k} C_{ijk} X_{ijk} + \sum_{i} \sum_{k} \sum_{m} C'_{ikm} X'_{ikm}$$

Subject to

$$[2] \quad \sum_k X'_{ikm} = D_{im} \quad \text{for all } i, m$$

$$[3] \sum_k x_{ijk} \leq s_{ij} \quad \text{for all } i, j$$

$$[4] \sum_i \sum_j x_{ijk} \leq w_k \quad \text{for all } k$$

$$[5] \sum_j x_{ijk} - \sum_m x_{ikm} = 0 \quad \text{for all } i, k$$

where  $Z$  = total transportation cost

$i$  = item group subscript

$j$  = source subscript

$k$  = depot subscript

$m$  = customer subscript

$x_{ijk}$  = lines of item group  $i$  shipped from source  $j$  to depot  $k$

$x_{ikm}$  = lines of item group  $i$  shipped from depot  $k$  to customer  $m$

$c_{ijk}$  = unit cost of shipping item group  $i$  from source  $j$  to depot  $k$

$c'_{ikm}$  = unit cost of shipping item group  $i$  from depot  $k$  to customer  $m$

$s_{ij}$  = amount of item group  $i$  available at source  $j$

$d_{im}$  = demand for item group  $i$ , customer  $m$

$w_k$  = capacity limitation (lines) at depot  $k$

In simple terms, the LP model seeks to minimize the total transportation cost subject to real world constraints. The total transportation cost is defined as the sum of inbound and outbound costs (equation [1]). The first constraint (equation [2]) is that the lines shipped out of the depots must meet the demand. The second constraint (inequality [3]) is that the lines shipped into the depots must not exceed the supply. The third constraint (inequality [4]) is that the workload at a depot must not exceed its capacity. For all the alternatives tested in this analysis, the warehouse capacity constraint was not applied. The last constraint (equation [5]) states that what goes out of a depot must equal what comes into the depot. In summary, the LP model is the classical transportation model which seeks to minimize transportation cost in a one echelon depot distribution system.

Since solving the LP model would be quite time-consuming if done manually, a computer was used to solve the LP model. That is, the minimum

transportation cost for each depot scenario was determined by matching the LP model to the scenario and then running the model on a computer. The output of the LP computer runs served as the basis for comparing the transportation costs of the ten depot scenarios.

2. Statistics used in the LP runs were, for the most part, collected from current F129 and F130 Transportation Reports.<sup>1</sup> Only the Dayton and Ogden reports were used. The statistics were as follows:

- a. Demand Pattern - developed from F130 Report (see Annex 1). There are a total of 57 customer areas.
- b. Production Pattern - extracted from a 1973 DESC Distribution Study (see Annex 1). There are a total of 50 source areas.
- c. Distance Information - taken from official distance manual (see Annex 2).
- d. Transportation Rates/Modes - computed from F129 and F130 Reports.

(1) Inbound transportation costs:

(a) All inbound lines were assigned the freight rate (as in 1973 DESC study).

(b) Using distances and F130 lines shipped freight and freight costs, the following rates were developed:

<u>Mileage</u>	<u>Cost per line per mile</u>
Up to 150	\$ .00445
300	.00054
600	.00050
Over	.00047

(c) The LP model requires that production equal demand, i.e., that the lines-in equal the lines-out. Since, in the real world, shipments or lines-out are much greater in number than receipts or lines-in, lines-in had to be converted to lines-out for the model. Accordingly, the inbound rates were multiplied by a conversion factor of .0996<sup>2</sup> to adjust for the inflated number of lines-in. In this manner, the inbound transportation cost is made to reflect a cost based on the true number of lines-in.

<sup>1</sup>F129 and F130 reports collect actual DLA second destination transportation costs and shipment data.

<sup>2</sup>Computed by dividing total lines-in by total lines-out.

(2) Outbound transportation costs:

(a) Three modes of shipment were considered, namely, air parcel post, surface parcel post, and truck.

(b) The percentages on each mode were developed from the F129 and F130 Reports. Modes other than the three above were consolidated into the mode with which they were most closely aligned. The final percentages varied with mileage and were as follows:

<u>Mileage</u>	<u>Air</u>	<u>Surface</u>	<u>Truck</u>
Up to 150	0.00%	82.76%	17.24%
300	4.57%	79.53%	15.90%
600	19.50%	43.70%	36.80%
Over	19.50%	56.59%	23.91%

(c) From the F130 Report, the average parcel post shipment weighed 2.02 pounds.

(d) Using the average weight of 2.02, parcel post rates per line were as follows:

<u>Mileage</u>	<u>Air</u>	<u>Surface</u>
Up to 150	\$2.05	\$ .97
300	2.05	1.02
600	2.15	1.15
1000	2.29	1.29
1400	2.43	1.46
1800	2.59	1.62
Over	2.78	1.74

(e) The truck rate was the same as the inbound rate.

(f) The final outbound rate was a combination of the above costs at the above percentages.

3. The selection of the alternative depot scenarios was based on results of LP runs made for the 1976 Electronics Distribution Study and a knowledge of present day item assignment.

a. Results of the LP runs presented in the 1976 Study showed the following:

(1) Columbus or Dayton were the optimal locations for a single depot system when considering only thru-put transportation costs.

(2) Richmond and Ogden were the optimal locations for a two depot system when considering only thru-put transportation costs.

b. Data from the National Inventory Record (30 Sep 1976) and the 1976 Dayton Material Release Order (MRO) History were used to determine item assignment. Items presently assigned to Dayton<sup>3</sup> were broken down into categories having to do with stockage at other depots. The breakdown is summarized as follows:

<u>Category</u>	<u>Items</u>	<u>MROs</u>
Dayton	230,621	545,703
Dayton and Norfolk	25,430	147,831
Dayton and Ogden	146,300	857,554
Dayton and Navy Only (Not at Norfolk)	19,130	39,350
Dayton, Norfolk, and Ogden	47,714	907,790
Dayton, Navy Only, and Ogden	11,984	23,571
	481,179	2,521,799

The Ogden MRO workload for 1976 was 1,255,831. Using the percent of total workload represented by the Dayton workload, the Dayton workload in each category was scaled up to represent the total workload in each of the categories. (See Annex 3 for diagram of DESC workload.)

c. Initial runs were made without constraining the geographic boundaries for any depot in a scenario. This established the "best" boundaries between depot based on the items to be assigned and thruput transportation costs (inbound plus outbound). Since the Standard Automated Materiel Management System (SAMMS) requires that a single boundary be adopted for a depot, the "best" boundaries had to be approximated by a single boundary.<sup>4</sup> This was accomplished by selecting a set of boundaries to accommodate the different items and locations of the candidate gaining depots. These boundaries are reflected in the constraints (which States are to be served by which depots) for each alternative.

4. A number of assumptions were involved in the approach to this analysis and should be considered when evaluating results. They were the following:

a. The selection of a single geographic location (prime) to represent States in computing inbound and outbound rates introduced approximation to LP transportation costs. That is, customers or production sources located anywhere within a State were assumed to have the same transportation rates as the prime.

b. The selection of primes to represent States also resulted in

<sup>3</sup>Items were considered assigned to Dayton if they had positive assets at Dayton and/or MROs in the last year.

<sup>4</sup>The cost to change SAMMS to accept multiple boundaries within a commodity outweigh the cost of approximating "best" boundaries by a single boundary, i.e., greater than \$20,000.

the allocation of a State to a depot as a single entity. Consequently, although several parts of a State might have been geographically cost effective to several depots, the entire State was allocated to the depot which was most cost effective to that State's prime.

c. Since the LP model handled all electronic items as homogeneous, all items were assumed to have the same production and demand patterns and transportation rates.

d. The production pattern was held constant for all runs; so that the benefits of alternative production patterns for alternative depot scenarios were not part of the results. That is, different vendors might have been cost favorable when comparing one scenario to another. Different vendors would have meant different production patterns with corresponding cost reductions in inbound rates.

e. The use of scaling assumes that the Ogden item breakdown is similar to the Dayton item breakdown. For example, the number of Ogden only items is in the same proportion to the number of Dayton only items as the total Ogden workload is to the total Dayton workload.

f. In the LP model, a depot ships only to States allocated to it. This rules out the practice of shipping to an area outside the depot's area when the primary depot to the receiving area is out of stock.

D. RESULTS

1. The depot scenarios examined are as follows:

<u>Alternative</u>	<u>Depots</u>	<u>Number of Item Groups</u>	<u>Boundary</u>
Baseline	Dayton and Ogden	1	Present
I	Norfolk, Richmond, and Ogden	2	Mississippi R.
II	Norfolk, Richmond, and Ogden	2	Appalachian Mts.
III	Norfolk, Richmond, and Ogden	2	Missouri R.
IV	Norfolk, Richmond, Ogden, and Columbus	3	Mississippi R.
V	Norfolk, Richmond, Ogden, and Memphis	3	Mississippi R.
VI	Norfolk, Richmond, and Ogden	3	Mississippi R.
VII	Norfolk, Richmond, Ogden, and Columbus	3	Missouri R.
VIII	Dayton	1	None
IX	Richmond, Ogden, and Columbus	2	Missouri R.

(See Annex 4 for details on Alternatives and Annex 5 for Maps depicting boundaries.)

2. The transportation costs resulting from the LP runs are as follows:

<u>Alternative</u>	<u>Depots</u>	<u>Cost</u>	<u>Difference from Baseline</u>
Baseline	Dayton and Ogden	\$4,564,251	
I	Norfolk, Richmond, and Ogden	4,414,472	-\$149,779
II	Norfolk, Richmond, and Ogden	4,541,215	- 23,036
III	Norfolk, Richmond, and Ogden	4,392,768	- 171,483
IV	Norfolk, Richmond, Ogden, and Columbus	4,427,770	- 136,481
V	Norfolk, Richmond, Ogden, and Memphis	4,514,868	- 49,383
VI	Norfolk, Richmond, and Ogden	4,754,516	190,265
VII	Norfolk, Richmond, Ogden, and Columbus	4,408,326	- 155,925
VIII	Dayton	5,291,682	727,431
IX	Richmond, Ogden, and Columbus	4,461,578	- 102,673

(See Annex 4 for details on distribution of Dayton workload.)

ANNEX 1

	<u>Page</u>
Demand Pattern . . . . .	A-10
Production Pattern . . . . .	A-11

## F130 REPORT

LINES SHIPPED PATTERN

<u>State/Area</u>	<u>%</u>	<u>State/Area</u>	<u>%</u>
California	11.21	Mississippi	.98
Europe (E)	7.56	District of Columbia	.82
North Pacific (E)	5.68	Kentucky	.73
Texas	5.44	Illinois	.73
Florida	5.09	Massachusetts	.70
Georgia	4.28	North Dakota	.67
Pennsylvania	4.25	Maine	.63
South Pacific (E)	3.68	Indiana	.63
New York	3.28	Arkansas	.59
New Jersey	3.10	Nebraska	.59
Hawaii (E)	3.04	Kansas	.54
Virginia	2.99	Missouri	.45
South Carolina	2.93	New Hampshire	.37
Mediterranean (E)	2.75	South Dakota	.31
Alaska (E)	2.74	Idaho	.30
North Carolina	2.31	Tennessee	.28
Utah	1.95	Minnesota	.27
Maryland	1.68	Montana	.25
Carribean (E)	1.67	Nevada	.25
Washington	1.65	Delaware	.25
Oklahoma	1.44	Connecticut	.25
Michigan	1.40	Wyoming	.24
Ohio	1.36	Wisconsin	.23
Arizona	1.35	Iowa	.19
Louisiana	1.22	Rhode Island	.11
North Atlantic (E)	1.13	Oregon	.08
Colorado	1.12	West Virginia	.08
New Mexico	1.12	Vermont	.04
Alabama	1.02		

E - Overseas

PRODUCTION PATTERN

<u>State</u>	<u>Line Items Awarded</u>	<u>Customer Returns</u>	<u>Percent of Total</u>
Ohio	57,666	243	19.20
Pennsylvania	47,849	3,630	16.86
New York	20,732	8,436	9.55
Southern California	15,280	10,109	8.32
Northern California	15,280	10,109	8.31
Illinois	14,697	998	5.14
Massachusetts	13,814	828	4.79
New Jersey	11,502	127	3.80
Connecticut	7,719	275	2.61
Virginia	1,447	5,291	2.20
Texas	1,931	3,731	1.85
Florida	2,285	2,832	1.67
Indiana	4,013	131	1.35
Wisconsin	3,867	--	1.26
North Carolina	1,943	1,449	1.11
Maryland	2,864	346	1.04
Iowa	3,120	--	1.02
Georgia	775	2,242	.98
Arizona	2,360	604	.97
South Carolina	1,314	1,153	.80
Nebraska	2,147	95	.73
Washington	637	1,290	.63
Oregon	1,883	--	.60
Michigan	1,642	181	.59
Missouri	1,607	120	.56
New Hampshire	1,655	--	.54
Kansas	1,229	190	.46
Oklahoma	477	916	.45
Minnesota	1,171	102	.41
Kentucky	849	--	.27
Colorado	766	--	.25
South Dakota	689	--	.22
Rhode Island	353	308	.21
Alabama	42	538	.18
Utah	83	392	.15
Maine	43	405	.14
New Mexico	37	379	.13
Louisiana	207	178	.12
Vermont	357	--	.11
Mississippi	153	150	.09
Delaware	11	251	.08
Idaho	200	--	.06
Tennessee	184	--	.06
Arkansas	10	161	.05

<u>State</u>	<u>Line Items Awarded</u>	<u>Customer Returns</u>	<u>Percent of Total</u>
Montana	1	129	.04
North Dakota	103	--	.03
West Virginia	31	--	.01
Wyoming	7	--	.00
Nevada	--	--	.00
Washington, D. C.	--	--	.00

## ANNEX 2

DISTANCE TABLE

STATE	PRIME	DEPOTS								
		DCSC	DESC	DGSC	DDMT	DDOU	NCAD	NSDN	NSDO	DDTC
1. Alabama	Montgomery	664	604	706	322	1876	875	740	2396	2354
2. Arizona	Phoenix	1931	1862	2266	1461	700	2300	2341	733	703
3. Arkansas	Little Rock	718	658	898	136	1459	1053	1018	1978	1936
4. California N. Alaska, North Pacific, South Pacific, and Hawaii	San Francisco	2441	2380	2878	2109	769	2770	2965	11	83
5. California S.	Los Angeles	2265	2196	2600	1795	742	2634	2675	368	338
6. Colorado	Denver	1278	1209	1674	1053	510	1631	1763	1231	1200
7. Connecticut	Hartford	658	739	437	1195	2282	290	457	3018	2987
8. Delaware	Dover	500	581	198	957	2157	141	195	2893	2862
9. Florida	Tampa	1040	982	823	752	2306	1032	842	2826	2788
10. Georgia	Atlanta	586	526	539	379	1915	708	575	2477	2435
11. Idaho	Boise	2003	1942	2440	1857	303	2332	2529	632	601
12. Illinois	Springfield	378	309	807	383	1346	747	894	2082	2051
13. Indiana	Indianapolis	185	116	614	463	1523	554	701	2259	2228

STATE	PRIME	DEPOTS								
		DCSC	DESC	DGSC	DDMT	DDOU	NCAD	NSDN	NSDO	DDTC
14. Iowa	Des Moines	629	582	1080	602	1071	958	1167	1807	1776
15. Kansas	Wichita	868	799	1264	550	1017	1237	1351	1703	1665
16. Kentucky	Louisville	207	147	558	378	1617	572	645	2347	2316
17. Louisiana and Caribbean	New Orleans	920	860	1033	393	1797	1148	1067	2243	2212
18. Maine	Augusta	916	990	697	1455	2511	550	719	3247	3216
19. Maryland	Baltimore	417	498	139	897	2074	70	223	2810	2779
20. Massachusetts	Boston	758	839	537	1295	2379	390	559	3115	3085
21. Michigan	Lansing	263	265	675	709	1608	537	762	2344	2313
22. Minnesota	St. Paul	720	688	1187	825	1227	1049	1274	1963	1932
23. Mississippi	Jackson	787	727	734	208	1703	1038	970	2160	2118
24. Missouri	Jefferson City	558	489	950	331	1257	927	1037	1987	1956
25. Montana	Helena	1761	1729	2228	1724	448	2090	2317	1103	1072
26. Nebraska	Omaha	762	701	1199	643	938	1091	1286	1674	1643
27. Nevada	Reno	2226	2165	2663	2042	554	2555	2752	210	179
28. New Hampshire	Concord	855	929	648	1406	2450	501	670	3186	3100
29. New Jersey	Trenton	497	578	272	1030	2154	127	294	2890	2863

STATE	PRIME	DEPOTS								
		DCSC	DESC	DGSC	DDMT	DDOU	NCAD	NSDN	NSDO	DDTC
30. New Mexico	Albuquerque	1479	1410	1814	1009	653	1848	1891	1089	1047
31. New York	Buffalo	330	404	518	901	1925	311	602	2661	2630
32. North Carolina	Raleigh	507	543	161	723	2151	370	195	2821	2779
33. North Dakota	Bismarck	1150	1118	1617	1226	923	1479	1706	1600	1569
34. Ohio	Columbus	6	79	492	576	1694	375	580	2430	2399
35. Oklahoma	Oklahoma City	931	862	1266	461	1146	1300	1341	1637	1595
36. Oregon	Portland	2406	2365	2863	2280	726	2735	2950	629	626
37. Pennsylvania	Harrisburg	372	453	211	917	2029	4	293	2765	2734
38. Rhode Island	Providence	722	803	501	1259	2348	354	521	3084	3053
39. South Carolina	Columbia	562	577	373	600	2118	570	408	2698	2656
40. South Dakota	Pierre	1098	1066	1565	1034	819	1427	1652	1555	1524
41. Tennessee	Nashville	380	320	603	202	1674	715	680	2300	2258
42. Texas	Austin	1232	1172	1455	650	1343	1567	1519	1725	1695
43. Utah	Salt Lake City	1709	1648	2146	1545	35	2038	2233	729	698
44. Vermont	Burlington	757	831	628	1328	2298	457	650	3034	3003
45. Virginia	Richmond	493	529	0	805	2137	209	87	2873	2842
46. Washington	Seattle	2331	2299	2798	2289	790	2660	2885	804	801

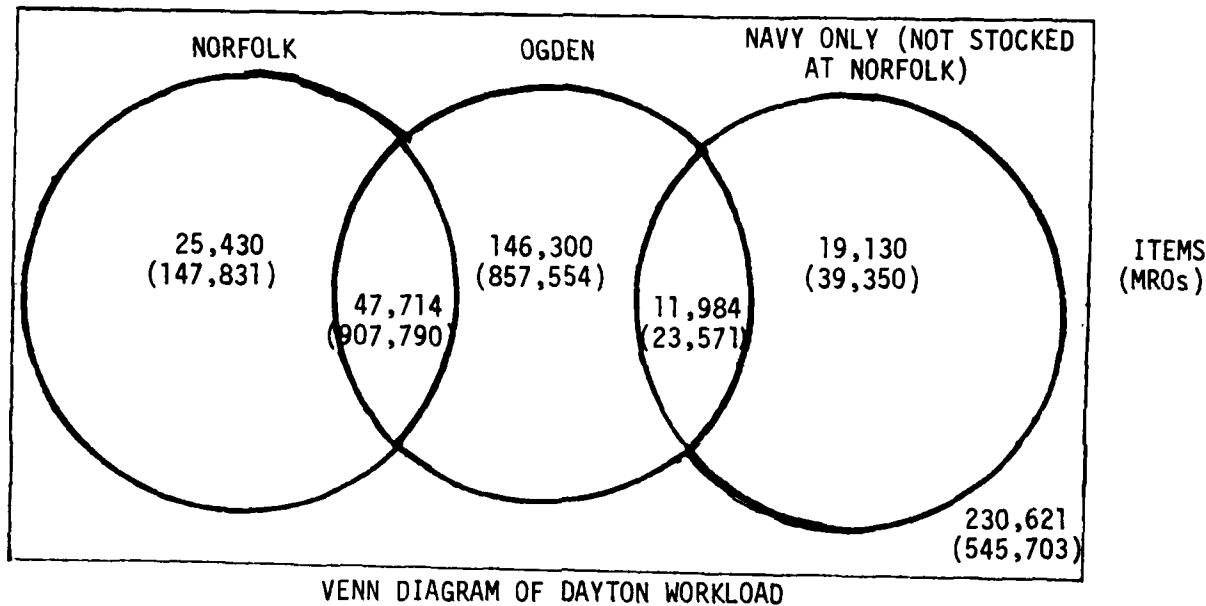
<u>STATE</u>	<u>PRIME</u>	<u>DEPOTS</u>								
		<u>DCSC</u>	<u>DESC</u>	<u>DGSC</u>	<u>DDMT</u>	<u>DDOU</u>	<u>NCAD</u>	<u>NSDN</u>	<u>NSDO</u>	<u>DDTC</u>
47. Washington, D.C.		414	495	102	859	2071	108	191	2807	2780
48. Wisconsin	Milwaukee	405	373	872	631	1432	734	959	2168	2137
49. West Virginia	Charleston	181	217	312	596	1825	405	404	2561	2530
50. Wyoming	Cheyenne	1267	1206	1704	1121	434	1596	1793	1170	1139
51. North Atlantic, Europe, Mediterranean	New York City (Norfolk, New Orleans)	545	622	324 (87)	1082 (393- Med Only)	2180	177	346	2916	2885

Number in parentheses represent change in prime port for overseas area.

ANNEX 3

ELECTRONICS WORKLOAD

1. Dayton - 2,521,799 MROs per year
  - 66.8% of total Dayton/Ogden workload
  - 481,179 items



VENN DIAGRAM OF DAYTON WORKLOAD

2. Ogden - 1,255,831 MROs per year
  - 33.2% of total Dayton/Ogden workload
3. Total - 3,777,630 MROs per year

ANNEX 4

BASELINE SCENARIO

1. Number of Item Groups - One
2. Item Group Assignment - Ogden and Dayton
3. Constraint -  
North Dakota }      Go to Ogden  
South Dakota }
4. Results
  - a. Transportation Cost - \$4,564,251
  - b. Boundary - Present

## SCENARIO I

### 1. Number of Item Groups - Two

a. Dayton and Navy only	39,350	MROs
Dayton, Navy only, and Ogden	23,571	MROs
Dayton and Norfolk	147,831	MROs
Dayton, Ogden, and Norfolk	907,790	MROs
Dayton Workload Item Group 1	<u>1,118,542</u>	MROs
	÷ .668	
Total Workload Item Group 1	<u>1,675,565</u>	MROs
b. Dayton	545,703	MROs
Dayton and Ogden	857,554	MROs
Dayton Workload Item Group 2	<u>1,403,257</u>	MROs
	÷ .668	
Total Workload Item Group 2	<u>2,102,065</u>	MROs

### 2. Item Group Assignment

- Item Group 1 to Norfolk and Ogden.
- Item Group 2 to Richmond and Ogden.

### 3. Constraint -

Arkansas	Louisiana	Nebraska	Go to Ogden
Iowa	Minnesota	Oklahoma	
Kansas	Missouri	Texas	

### 4. Results

a. Transportation Cost - \$4,414,472

b. Boundary - Mississippi

c. Distribution of Dayton Workload

(1) Ogden	Item Group 1	275,922	MROs
	Item Group 2	<u>219,938</u>	MROs
	Total	<u>495,860</u>	MROs
(2) Norfolk	Item Group 1	898,604	MROs
(3) Richmond	Item Group 2	1,127,335	MROs

## SCENARIO II

1. Number of Item Groups - Same as Scenario I
2. Item Group Assignment - Same as Scenario I
3. Constraint -

Alabama	Kansas	Mississippi	Tennessee	}	Go to Ogden
Arkansas	Kentucky	Missouri	Texas		
Illinois	Louisiana	Nebraska	Wisconsin		
Indiana	Michigan	Ohio			
Iowa	Minnesota	Oklahoma			

4. Results
  - a. Transportation Cost - \$4,541,215
  - b. Boundary - Appalachian Mountains
  - c. Distribution of Dayton Workload

(1) Ogden	Item Group 1	343,259 MROs
	Item Group 2	430,633 MROs
	Total	<u>773,892</u> MROs
(2) Norfolk	Item Group 1	775,283 MROs
(3) Richmond	Item Group 2	972,624 MROs

### SCENARIO III

1. Number of Item Groups - Same as Scenario I

2. Item Group Assignment - Same as Scenario I

3. Constraints

a. Kansas Nebraska	Oklahoma Texas } Texas } <td>Go to Ogden</td>	Go to Ogden
b. Arkansas Iowa Louisiana	Minnesota Missouri } Missouri } <td>Go to Richmond and Norfolk</td>	Go to Richmond and Norfolk

4. Results

a. Transportation Cost - \$4,392,768

b. Boundary - Missouri River

c. Distribution of Dayton Workload

(1) Ogden	Item Group 1	174,363	MROs
	Item Group 2	218,746	MROs
	Total	393,109	MROs
(2) Norfolk	Item Group 1	944,179	MROs
(3) Richmond	Item Group 2	1,184,511	MROs

## SCENARIO IV

### 1. Number of Commodities - Three

a. Dayton and Navy only	39,350	MROs
Dayton, Navy only, and Ogden	23,571	MROs
Dayton and Norfolk	147,831	MROs
Dayton, Ogden, and Norfolk	907,790	MROs
Dayton Workload Item Group 1	1,118,542	MROs
	÷ .668	
Total Workload Item Group 1	1,675,565	MROs
b. Dayton and Ogden	857,554	MROs
	÷ .668	
Total Workload Item Group 2	1,284,607	MROs
c. Dayton	545,703	MROs
	÷ .668	
Total Workload Item Group 3	817,458	MROs

### 2. Item Group Assignment

- a. Item Group 1 to Norfolk and Ogden
- b. Item Group 2 to Richmond and Ogden
- c. Item Group 3 to Columbus and Ogden

### 3. Constraint - Same as Scenario I

### 4. Results

- a. Transportation Cost - \$4,427,770
- b. Boundary - Mississippi River
- c. Distribution of Dayton Workload

(1) Ogden	Item Group 1	219,938	MROs
	Item Group 2	168,620	MROs
	Item Group 3	107,302	MROs
	Total	495,860	MROs
(2) Norfolk	Item Group 1	898,604	MROs
(3) Richmond	Item Group 2	688,934	MROs
(4) Columbus	Item Group 3	438,401	MROs

## SCENARIO V

1. Number of Item Groups - Same as Scenario IV
2. Item Group Assignment
  - a. Item Group 1 to Norfolk and Ogden
  - b. Item Group 2 to Richmond and Ogden
  - c. Item Group 3 to Memphis and Ogden
3. Constraint - Same as Scenario I
4. Results
  - a. Transportation Cost - \$4,514,868
  - b. Boundary - Mississippi River
  - c. Distribution of Dayton Workload

(1) Ogden	Item Group 1	219,938	MROs
	Item Group 2	168,620	MROs
	Item Group 3	107,302	MROs
	Total	495,860	MROs
(2) Norfolk	Item Group 1	898,604	MROs
(3) Richmond	Item Group 2	688,934	MROs
(4) Memphis	Item Group 3	438,401	MROs

SCENARIO VI

1. Number of Item Groups - Same as Scenario IV
2. Item Group Assignment
  - a. Item Group 1 to Norfolk and Ogden
  - b. Item Group 2 to Richmond and Ogden
  - c. Item Group to Ogden
3. Constraint - Same as Scenario I
4. Results
  - a. Transportation Cost - \$4,754,516
  - b. Boundary - Mississippi River
  - c. Distribution of Dayton Workload

(1)	Item Group 1	219,938	MROs
	Item Group 2	168,620	MROs
	Item Group 3	545,703	MROs
	Total	934,261	MROs
(2) Norfolk	Item Group 1	898,604	MROs
(3) Richmond	Item Group 2	688,934	MROs

## SCENARIO VII

1. Number of Item Groups - Same as Scenario IV
  2. Item Group Assignment - Same as Scenario IV
  3. Constraints



## 4. Results

- a. Transportation Cost - \$4,408,326
  - b. Boundary - Missouri River
  - c. Distribution of Dayton Workload

(1) Ogden	Item Group 1	174,363	MROs
	Item Group 2	133,679	MROs
	Item Group 3	<u>85,067</u>	MROs
	Total	393,109	MROs
(2) Norfolk	Item Group 1	944,179	MROs
(3) Richmond	Item Group 2	723,875	MROs
(4) Columbus	Item Group 3	460,636	MROs

SCENARIO VIII

1. Number of Item Groups - One
2. Item Group Assignment - Dayton
3. Constraint - None
4. Results
  - a. Transportation Cost - \$5,291,682
  - b. Boundary - None

## SCENARIO IX

### 1. Number of Item Groups - Two

a. Dayton and Navy only	39,350	MROs
Dayton	545,703	MROs
Dayton and Norfolk	147,831	MROs
Dayton Workload Item Group 1	732,884	MROs
	÷ .668	
Total Workload Item Group 1	1,097,853	MROs
b. Dayton, Navy only, and Ogden	23,571	MROs
Dayton and Ogden	857,554	MROs
Dayton, Ogden, and Norfolk	907,790	MROs
Dayton Workload Item Group 2	1,788,915	MROs
	÷ .668	
Total Workload Item Group 2	2,679,777	MROs

### 2. Item Group Assignment

- a. Item Group 1 to Ogden and Columbus
- b. Item Group 2 to Ogden and Richmond

### 3. Constraints - Same as Scenario VII

### 4. Results

- a. Transportation Cost - \$4,461,578

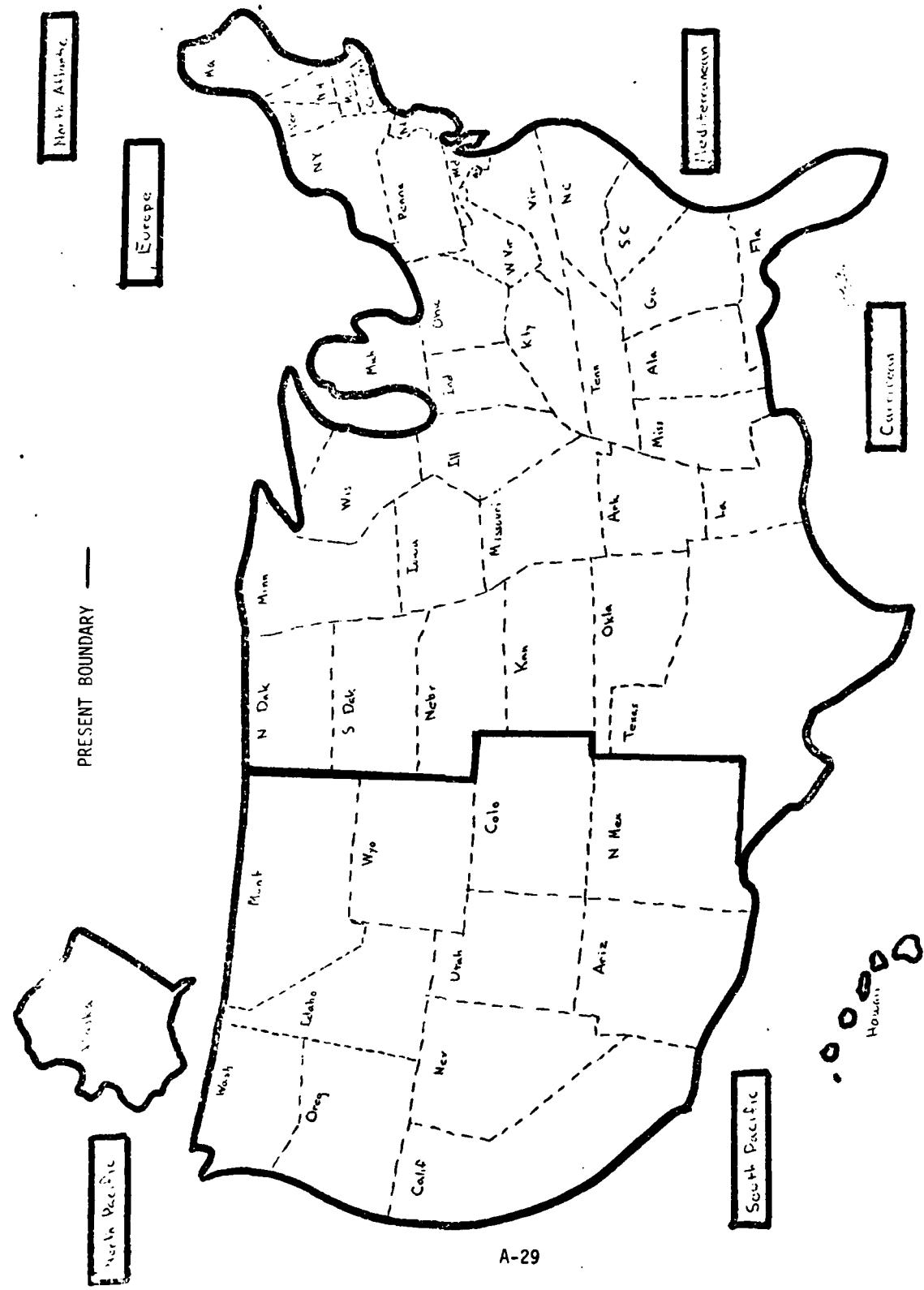
- b. Boundary - Missouri River

(1) Ogden	Item Group 1	114,245	MROs
	Item Group 2	278,868	MROs
	Total	393,113	MROs
(2) Columbus	Item Group 1	618,639	MROs
(3) Richmond	Item Group 2	1,510,047	MROs

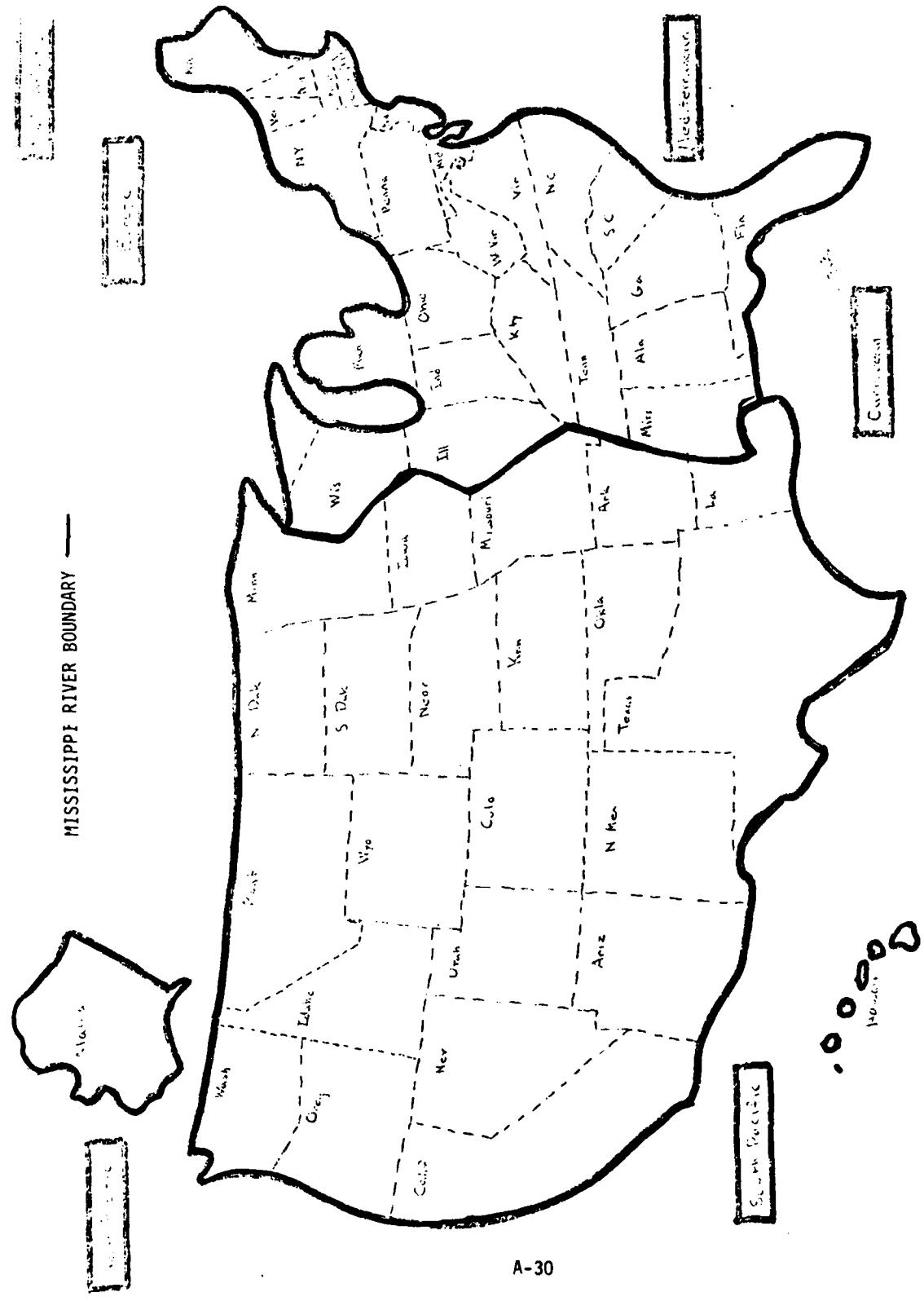
ANNEX 5

MAPS

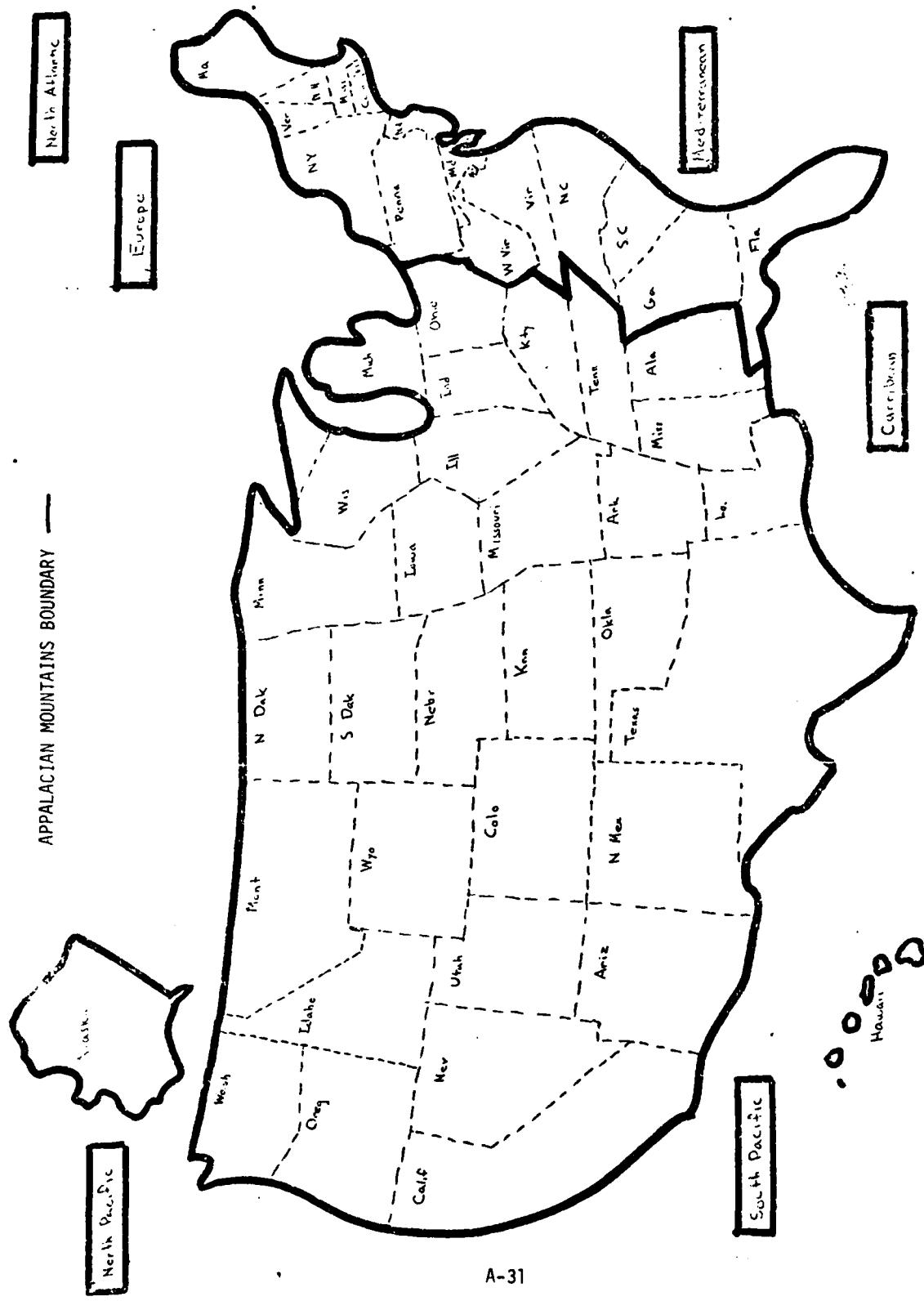
<u>Boundary</u>	<u>Page</u>
Present . . . . .	A-29
Mississippi River . . . . .	A-30
Appalachian Mountains . . . . .	A-31
Missouri River . . . . .	A-32



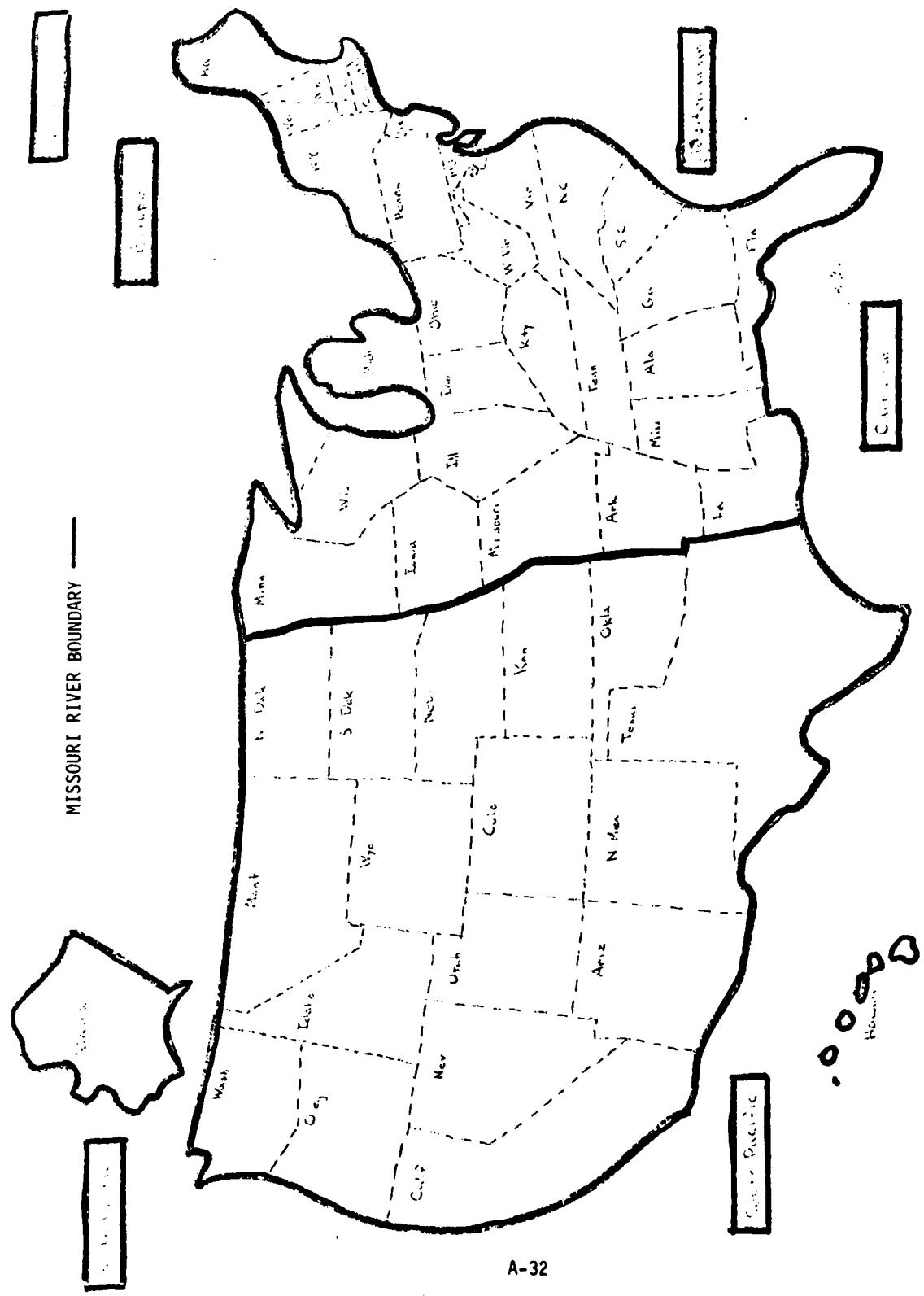
MISSISSIPPI RIVER BOUNDARY —



APPALACIAN MOUNTAINS BOUNDARY —



## MISSOURI RIVER BOUNDARY —



A-32

APPENDIX B

COMPUTATION OF ONE-TIME COSTS AND RECURRING SAVINGS

ALTERNATIVE 1

Relocate the Dayton Depot to Richmond, Ogden and Norfolk

Alternative 1. Relocate the Dayton Depot to Richmond, Ogden and Norfolk

PERSONNEL SAVINGS/TRANSFERS

COST CODE	CURRENT	SAVINGS	TRANSFERS TO		
			DGSC	DDOU	NSC-N
910	318	11	3	1	4
920	37	7	--	--	--
930	143	8	--	--	--
940	29	7	3	--	2
950	87	4	--	--	--
960	199	5	1	--	--
970	14	--	--	--	--
<b>Total</b>					
900	827	42	7	1	6
100	310	1	--	--	--
200	389	--	--	--	--
300	567	124	207	74	151
400	697	--	--	3	--
<b>Total</b>	2,790	167	214	78	157

ALTERNATIVE 1. Relocate the Dayton Depot to Richmond, Ogden and Norfolk

ONE-TIME PERSONNEL COST (\$000)

GAINER	LOSER SPACES	TRANSFERS				TERMINATIONS				TRAINING				
		NR	%	ACCEPT	PCS COST	%	NR	TERM COST	COST	NOT ACCEPT	%	NR	TRAIN COST	COST
DGSC	616	214	7	15	6.147	92.2	25	154	6.575	1,012.6	93	199	.244	48.6
DDOU		78	5	4	6.147	24.6					95	74	.244	18.1
NSCN		157	5	8	6.147	49.2					95	149	.244	36.4
		449	27		166.0			154			1,012.6		422	103.1

Alternative 1. Relocate the Dayton Depot to Richmond, Ogden and Norfolk

ADVANCE HIRE<sup>1</sup>

COST CODE	ANNUAL SALARY	NUMBER OF PERSONNEL	\$000
910	20.4	7	11.9
920	17.1	--	--
930	18.9	--	--
940	19.5	4	6.5
950	15.9	--	--
960	21.7	1	1.8
970	15.6	--	--
<b>Total</b>			
900	--	12	20.2
100	19.5	--	--
200	18.7	--	--
300	16.4	407	556.2
400	19.3	3	4.8
<b>Total</b>		422	581.2

<sup>1</sup>Assumes one-month overlap of personnel for training.

Alternative 1. Relocate the Dayton Depot to Richmond, Ogden and Norfolk

Relocation of Bulk Stock

A. Pulling, Packing, Banding and Loading

441,435 items

10,000 per person year

44.1 person years

44.1 @ \$16,400 = \$723,240

B. Transportation

324,214 single bin locations

1,296 bin boxes per truck

251 trucks

1,114,703 cu. ft. of bulk

1,724 cu. ft. per truck

647 trucks

898 trucks @ \$485 = \$435,530

C. Receipts

DGSC - 328,941 items

12,500 items per person year

26.3 person years

NSCN - 112,494 items

6,250 items per person year

18.0 person years

44.3 person years @ \$16,400 = \$726,520

D. Total - \$1,885,290

Alternative 1. Relocate the Dayton Depot to Richmond, Ogden and Norfolk

PERSONNEL SAVINGS

COST CODE	ANNUAL SALARY	NUMBER OF PERSONNEL	\$000
910	20.4	11	224.4
920	17.1	7	119.7
930	18.9	8	151.2
940	19.5	7	136.5
950	15.9	4	63.6
960	21.7	5	108.5
970	15.6	--	--
<b>Total</b>			
900	--	42	803.9
100	19.5	1	19.5
200	18.7	--	--
300	16.4	124	2,033.6
400	19.3	--	--
<b>Total</b>	--	167	2,857.0

Alternative 1a. Relocate the Dayton Depot to Richmond, Ogden and Norfolk

NON-PERSONNEL SAVINGS

<u>COST CODE</u>	<u>SAVINGS (\$000)</u>
910	5
920	6
930	75
940	2
950	8
960	--
970	--
TOTAL 900	96
100	--
200	--
300	--
400	--
TOTAL	96

Alternative 1a. Relocate the Dayton Depot to Richmond, Ogden and Norfolk

ADPE SAVINGS

DESC One-time Savings	\$ 3,600
DESC Recurring Savings	61,968
DGSC Recurring Costs	<u>20,520</u>
Net Recurring Savings	\$41,448

Alternative 1a. Relocate the Dayton Depot to Richmond, Ogden and Norfolk

DUPLICATE LOCATIONS

\$20.66 per split shipment based on a sample from DESC and DCSC.

NSCN receives approximately 17,000 new procurement shipments per year.  
Source: RCS 26 Report, element 511A, FY 77 through March 1977.

$\$20.66 \times 17,000 = \$351,220$

APPENDIX D

COMPUTATION OF ONE-TIME COSTS AND RECURRING SAVINGS

ALTERNATIVE 2

Relocate the Dayton Depot to Richmond, Ogden, Columbus and Norfolk

Alternative 2. Relocate the Dayton Depot to Richmond, Ogden, Columbus and Norfolk

PERSONNEL SAVINGS/TRANSFERS

COST CODE	CURRENT	SAVINGS	TRANSFERS TO			
			DGSC	DDOU	NSC-N	DCSC
910	318	11	2	1	4	1
920	37	7	--	--	--	--
930	143	8	--	--	--	--
940	29	7	1	--	2	2
950	87	4	--	--	--	--
960	199	5	1	--	--	--
970	14	--	--	--	--	--
<b>Total</b>						
900	827	42	4	1	6	3
100	310	1	--	--	--	--
200	389	--	--	--	--	--
300	567	124	127	74	151	80
400	697	--	--	3	--	--
<b>Total</b>	2,790	167	131	78	157	83

Relocate the Dayton Depot to Richmond, Ogden, Columbus and Norfolk Alternative 2.

**ONE-TIME PERSONNEL COST (\$000)**

Alternative 2. Relocate the Dayton Depot to Richmond, Ogden,  
Columbus and Norfolk

ADVANCE HIRE<sup>1</sup>

COST CODE	ANNUAL SALARY	NUMBER OF PERSONNEL	\$000
910	20.4	7	11.9
920	17.1	--	--
930	18.9	--	--
940	19.5	4	6.5
950	15.9	--	--
960	21.7	1	1.8
970	15.6	--	--
<b>Total</b>			
900	--	12	20.2
100	19.5	--	--
200	18.7	--	--
300	16.4	403	550.8
400	19.3	3	4.8
<b>Total</b>	--	418	575.8

<sup>1</sup>Assumes one-month overlap of personnel for training.

Alternative 2. Relocate the Dayton Depot to Richmond, Ogden, Columbus and Norfolk

Relocation of Bulk Stock

A. Pulling, Packing, Banding and Loading

441,435 items

10,000 per person year

44.1 person years

44.1 @ \$16,400 = \$723,240

B. Transportation

324,214 single bin locations

1,296 bin boxes per truck

251 trucks

1,114,703 cu. ft. of bulk

1,724 cu. ft. per truck

647 trucks

638 trucks @ \$485 = \$309,430 (DGSC and NCSN)

260 trucks @ \$202 = \$52,520 (DCSC)

C. Receipts

DGSC - 201,021 items

12,500 items per person year

16.1 person years

DCSC - 127,920 items

12,500 items per person year

10.2 person

NCSN - 112,494 items

6,250 items per person year

18.0 person years

44.3 person years @ \$16,400 = \$726,520

D. Total - \$1,811,710

Alternative 2. Relocate the Dayton Depot to Richmond, Ogden,  
Columbus and Norfolk

PERSONNEL SAVINGS

COST CODE	ANNUAL SALARY	NUMBER OF PERSONNEL	\$000
910	20.4	11	224.4
920	17.1	7	119.7
930	18.9	8	151.2
940	19.5	7	136.5
950	15.9	4	63.6
960	21.7	5	108.5
970	15.6	--	--
<b>Total</b>			
900	--	42	803.9
100	19.5	1	19.5
200	18.7	--	--
300	16.4	124	2,033.6
400	19.3	--	--
<b>Total</b>		167	2,857.0

Alternative 2. Relocate the Dayton Depot to Richmond, Ogden, Columbus and Norfolk

NON-PERSONNEL SAVINGS

<u>COST CODE</u>	<u>SAVINGS (\$000)</u>
910	5
920	6
930	98
940	3
950	8
960	--
970	--
TOTAL 900	120
100	--
200	--
300	--
400	--
TOTAL	120

Alternative 2. Relocate the Dayton Depot to Richmond, Ogden, Columbus and Norfolk

ADPE SAVINGS

DESC One-time Savings	\$ 3,600
DESC Recurring Savings	61,968
DGSC Recurring Costs	<u>20,520</u>
Net Recurring Savings	41,448

Alternative 2. Relocate the Dayton Depot to Richmond, Ogden, Columbus and Norfolk

DUPLICATE LOCATIONS

\$20.66 per split shipment based on a sample from DESC and DCSC.

NSCN receives approximately 17,000 new procurement shipments per year.  
Source: RCS 26 Report, element 511A, FY 77 through March 1977.

$\$20.66 \times 17,000 = \$351,220$

APPENDIX E

COMPUTATION OF ONE-TIME COSTS AND RECURRING SAVINGS

ALTERNATIVE 3

Relocate the Ogden Electronics Mission to Dayton

AD-A103 304

DEFENSE LOGISTICS AGENCY ALEXANDRIA VA F/G 15/5  
AN ANALYSIS OF THE ELECTRONICS DISTRIBUTION DEPOT MISSION AT DA--ETC(U)  
DEC 77

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ALTERNATIVE 3. RELOCATE THE OGDEN ELECTRONICS MISSION TO DAYTON

	<u>TRANSFERS</u>	<u>SAVINGS</u>	<u>TOTAL</u>
No. MROs	1,260,325		
No. Receipts	94,100		
No. People	228	28	256
P900	(4)	(15)	(19)
P300	(224)	(13)	(237)

Alternative 3. Relocate the Martin Electronics Mission to Dayton

ONE-TIME PERSONNEL COST (\$000)

GAINER	LOSER SPACES	NR	TRANSFERS			TERMINATIONS			TRAINING		
			ACCEPT	%	NR	PCS COST	COST	%	NR	TERM COST	COST
DESC	256	228	5	11	6.147	67.6		25	64	6.575	420.8
											No training costs.

Alternative 3. Relocate the Ogden Electronics Mission to Dayton

NON-PERSONNEL COST COMPUTATIONS

1. Bulk Move

Assume 50% of the items would have to be moved or 147,000 items.

Using the same rationale as moving the items from DESC to DGSC:

192 trucks @ \$1,588 =	\$304,896
15 manyears to process at DDOU	
15 @ \$16,400	246,000
10 manyears at DESC to receive	
10 @ \$16,400	<u>164,000</u>
Total	\$714,896

Alternative 3. Relocate the Ogden Electronics Mission to Dayton

1.

PERSONNEL SAVINGS

<u>Cost Code</u>	<u>Personnel Transfers</u>	<u>Personnel Reductions</u>	<u>(\$000) Annual Salary</u>	<u>Savings (\$000)</u>
900	4	15	19.5	292.5
300	<u>224</u>	<u>13</u>	<u>16.4</u>	<u>213.2</u>
Total	228	28	-	505.7

2.

SHIFT DIFFERENTIAL

<u>Shift</u>	<u>People Needed</u>	<u>Differential</u>	<u>Salary (\$000)</u>	<u>Cost (\$000)</u>
2nd	41	.075	16.4	50.4
3rd	<u>14</u>	<u>.100</u>	<u>16.4</u>	<u>23.0</u>
Total	45	-	-	73.4

3.

NON-PERSONNEL SAVINGS

Based on the same ratio of personnel reductions to non-personnel cost reductions as Alternative 1 - \$18,000.

Alternative 3. Relocate the Ogden Electronics Mission to Dayton

4. Duplicate Locations

\$20.66 per split shipment

DDOU - 72,479 new procurement shipments

Source: RCS 232 Report FY 76

DDOU has 292,349 DESC items in storage.

Source: DESC Month-end Asset File, April 1977

DDOU and DESC have 212,999 common items in storage.

Source: DESC Month-end Asset File, April 1977

$$\frac{212999}{292349} \times 72479 \approx 52,800$$

Estimated number of split shipments between DESC and DDOU.

Cost of duplicate locations (split shipments)

$$\$20.66 \times 52,800 = \$1,090,848$$

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